

Research Product 92-13

AD-A258 241



**Functional Specifications for Selected
Staff Workstations Within the Close
Combat Test Bed's Automated Battalion
Tactical Operations Center**



September 1992

92-28805



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Fort Knox Field Unit
Training Systems Research Division

U.S. Army Research Institute for the Behavioral and Social Sciences

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1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE 1992, September		3. REPORT TYPE AND DATES COVERED Final Sep 90 - May 92	
4. TITLE AND SUBTITLE Functional Specifications for Selected Staff Workstations Within the Close Combat Test Bed's Automated Battalion Tactical Operations Center				5. FUNDING NUMBERS DAHC35-89-D-0044 63007A 795 3101 C09	
6. AUTHOR(S) LaVine, Nils D.					
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Micro Analysis & Design Inc. 3300 Mitchell Lane, Suite 175 Boulder, CO 80301				8. PERFORMING ORGANIZATION REPORT NUMBER --	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Research Institute for the Behavioral and Social Sciences ATTN: PERI-IK 5001 Eisenhower Avenue Alexandria, VA 22333-5600				10. SPONSORING/MONITORING AGENCY REPORT NUMBER ARI Research Product 92-13	
11. SUPPLEMENTARY NOTES Contracting Officer's Representative, Kathleen A. Quinkert					
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.				12b. DISTRIBUTION CODE --	
13. ABSTRACT (Maximum 200 words) This report contains functional specifications for simulating an Automated Battalion Tactical Operations Center (BN TOC) within the Close Combat Test Bed (CCTB). These specifications are an important step in simulating new systems and technologies. The simulation allows researchers at the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) to address training and soldier performance issues related to command, control, and communications (C ³) during the early stages of systems development. The Automated BN TOC consists of S2 (Intelligence), S3 (Operations), and BN Executive Officer workstations to support mission planning and execution. Descriptions of these staff support functions provide background information to those interested in the functional and operational details of this BN TOC. Information contained in this report will assist in determining requirements for C ³ systems and training development programs for military personnel.					
14. SUBJECT TERMS Close Combat Test Bed (CCTB) Tactical Operations Center (TOC)				15. NUMBER OF PAGES 164	
				16. PRICE CODE --	
17. SECURITY CLASSIFICATION OF REPORT Unclassified		18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified		19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	
				20. LIMITATION OF ABSTRACT Unlimited	

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**Functional Specifications for Selected Staff
Workstations Within the Close Combat Test Bed's
Automated Battalion Tactical Operations Center**

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September 1992

**Army Project Number
2Q263007A795**

Training Simulation

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FOREWORD

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) investigates issues pertaining to soldier performance in simulated future combat environments. Simulation of new systems and technologies provides ARI researchers with a method for addressing training and soldier performance issues related to command, control, and communications (C³) during the earliest stages of systems development.

This report was prepared under the science and technology task entitled "Training Requirements for the Future Integrated Battlefield." ARI's involvement in this research supports two Memoranda of Understanding. One agreement, between ARI and the United States Army Armor Center and School that focuses on research in future battlefield conditions, was signed on 12 April 1989. The second, between ARI and the Tank Automotive Command (TACOM), focuses on the Combat Vehicle Command and Control System (CVCC) and was signed on 22 March 1989.

This report documents the current Automated Battalion Tactical Operations Center (BN TOC) within the Close Combat Test Bed (CCTB), formerly referred to as the Simulation Networking-Developmental Facility, or SIMNET-D. The physical and functional descriptions of the selected staff workstations include how the workstations fit into and interact with other components of the Combat Vehicle Command and Control program. This effort is especially pertinent to researchers interested in automated command, control, and communications (C³) because it details a current, interactive, working system that has been tested under realistic conditions.

The results of this effort have been briefed to the Director and Chief of the Analysis and Simulation Division, Combat Developments, U.S. Army Armor School.


EDGAR M. JOHNSON
Technical Director

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**FUNCTIONAL SPECIFICATIONS FOR SELECTED STAFF WORKSTATIONS WITHIN
THE CLOSE COMBAT TEST BED'S AUTOMATED BATTALION TACTICAL
OPERATIONS CENTER**

EXECUTIVE SUMMARY

Requirement:

This report provides functional specifications documentation for the simulation of Automated Battalion Tactical Operations Center (BN TOC) workstations within the Close Combat Test Bed (CCTB).

Procedure:

Multiple approaches were taken to complete this report. For documentation of the BN TOC, a hands-on approach was used. Researchers consulted with the CCTB staff and engineers to determine the functionality of the system. These approaches were taken so that the maximum information available on the Automated BN TOC could be included in the report.

Findings:

Staff workstations within the BN TOC are complex and flexible, as can be seen in the documentation of the system. Flexibility was built into the system to allow a TOC staff to easily accomplish their duties in a manner that best suits their needs. The power of the system is evident in the functionality built into the system to accomplish tasks previously done manually with paper maps, grease pencils, handwritten correspondence, and voice radio traffic.

Utilization of Findings:

This report can most effectively be employed by developers and users of systems like the BN TOC. Users can determine how the current system within the CCTB operates and either build a system like the one documented, improve on the existing system, or develop new features for the current system. The report will also help with the training of military personnel who will either test or use the system themselves.

**FUNCTIONAL SPECIFICATIONS FOR SELECTED STAFF WORKSTATIONS WITHIN
THE CLOSE COMBAT TEST BED'S AUTOMATED BATTALION TACTICAL
OPERATIONS CENTER**

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**FUNCTIONAL SPECIFICATIONS FOR SELECTED STAFF WORKSTATIONS
WITHIN THE CLOSE COMBAT TEST BED'S AUTOMATED BATTALION
TACTICAL OPERATIONS CENTER**

Introduction

The purpose of this document is to provide functional and physical documentation for the Automated Battalion (BN) Tactical Operations Center (TOC) workstations within the Combat Vehicle Command and Control (CVCC) environment. This document is intended to provide the reader with a detailed understanding of the functional or "how the system" works description of the BN TOC. **This document addresses only the prototype systems located in the Close Combat Test Bed (CCTB) and does not provide discussions on alternative designs or current "real world" systems that exist.**

A tactical operations center or TOC is used to provide consolidated Command and Control (C²) at unit levels of battalion and above. FM 101-5 (1984) "Staff Organizations and Operations" provides details on the duties of a staff within a TOC.

The Automated BN TOC is a futuristic version of what is **currently done in a manual/nonautomated fashion to accomplish consolidated C².** The Automated BN TOC program is an extension of the CVCC program going on at the Close Combat Test Bed in Fort Knox, Kentucky. Both the Automated BN TOC and CVCC programs are **designed to help in the concept formulation stages of future weapon systems and organizations for the Army.**

The automated TOC fits in with recent C² automation developed within CCTB tank simulators. These simulators have the capability to send and receive digital messages and map overlays to and from other deployed vehicles. With this increased capability, an appropriate TOC was needed and subsequently developed to handle these new prototype communication methods. This document details the functionality of how this equipment works and fits into the CVCC environment.

This documentation will be limited to the systems within the BN TOC that make up the TOC workstations and the interaction with other CVCC systems either within vehicle simulators, other TOC workstations, or higher level units. The prototype BN TOC system presented is associated with version 1.6 of the BN TOC software. Any later release of the above software will not be reflected in this document unless it is appended at a later date.

Overview of the Document

This document will begin with general requirements for the TOC workstations that currently make up the Automated BN TOC. Then, the general functioning of the TOC workstations is discussed. Finally, a detailed description of the functionality of the TOC workstations is provided.

General BN TOC Requirements

The Automated BN TOC is designed around the concept of the TOC workstation. The TOC workstation is used to replace the current organization of a "real world" TOC, which has each section working out of its own vehicle with its own maps and radios. Within the automated TOC, each relevant section/activity will utilize a computer workstation to perform both its planning and mission execution duties. The Automated BN TOC workstations have initially been developed to incorporate the S3 (Operations), S2 (Intelligence), and overall supervisory (BN Executive Officer--CO) responsibilities within the BN TOC. A special configuration of any of the above workstations is the Coordinator workstation. Coordinator workstation is used to control any test or use of the BN TOC workstations and simulators hooked into the system at that time.

TOC Workstations

The equipment currently in the TOC includes two identical workstations and a large screen situation display. The workstations consist of a SUN SPARCstation 1 computer with a keyboard, two--each 19" color monitors, and a mouse. The workstations are set up with the monitors in a side-by-side configuration. The left color monitor is always the Map Display, which shows a military map, and the right color monitor is the Communication and Planning Display, which allows communication and written planning to occur. This configuration is shown in Figure

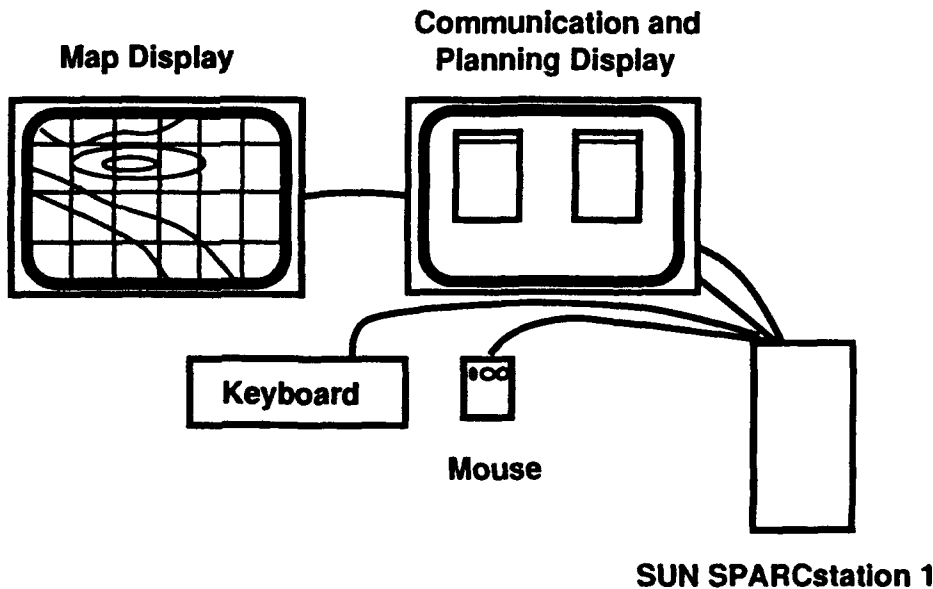


Figure 1. BN TOC Workstation Configuration

The workstations allow the planning and mission execution duties normally conducted on acetate, paper maps, and radio to be performed on the workstation in a digital computer medium. The workstations receive all Position Navigation (POSNAV) data on vehicles outfitted with such equipment. This allows the TOC operators to track the location of all vehicles within their own and adjacent units.

The workstations are also connected to the Single-Channel Ground and Airborne Radio System (SINCGARS) allowing both voice and digital message communication with deployed vehicles and the higher level headquarters. All digital and voice transmissions are sent out through this radio system.

A local area network provides the communication links necessary for information to be passed among workstations and the Situation Display within the automated BN TOC. The workstations are capable of sending and receiving the same digital reports that are available within the tank simulators.

The Situation Display consists of a Sun SPARCstation 1 computer, keyboard, a mouse, and a single large screen TV. Currently, the Situation Display has a limited subset of the functions that will be discussed with the other workstations (i.e. S2 and S3 workstations). The only functions currently available on the Situation Display allow overlays, message/report icons, and Position Navigation (POSNAV) icons to be stored and displayed on its screen. Overlays, messages, and formats cannot be created as can be done on the other workstations.

General Workstation Functionality

Workstation Modules

The workstation software functions are broken down into four (4) basic modules that interact. The four modules are: Message Module, Format Module, Map Module, and Echelon Module. For a detailed discussion of the different modules, see "SIMNET CVCC Battalion TOC Workstation User Manual Release 1.5" (Bolt, Beranek, and Newman, Inc. [BBN], 1991).

Screen Layout

The TOC workstation displays are broken down into three (3) main types of screens based on the modules above. The first consists of screens from the Message module. These screens are for sending, receiving, and filing messages. These functions are provided in the Infolder or other folders that originated from the Infolder. The second type of screen comes from the Format module. These screens are available when planning formats are being developed to plan for a future operation. Screens from the Message and Format module appear on the Communications and Planning Display. The last type of screen comes from the Map

module. These screens are displayed on the Map Display. These screens show relevant POSNAV data, overlays, message icons, and digital map terrain of the area of operation.

Interface Structure

The operator interface of the BN TOC is based on a hierarchy of menu types and selectors. The types of menus and selectors available are: Menu Bars, Pulldown Windows, Cascading Windows, Radio Buttons, Highlighted Fields, and Scroll Bars. A detailed description of these display features is available in the "SIMNET CVCC Battalion TOC Workstation User Manual Release 1.5" (BBN, 1991). The operator uses these menus and selectors to execute functions of the TOC workstations.

There are two input devices available for the workstation. These include the workstation's keyboard and mouse. No other input devices are available. There are three conventions used in this document that refer to the methods for inputting data. They are: Selecting, Designating, and Typing. Selecting is used to pick desired fields, functions, words, symbols, or numbers on the screen. Designating is used to pick locations for input into a report. Typing is used to type text into messages or to create formats or overlays.

The menu structure of the BN TOC workstations is very flexible yet logical in its approach. The user can perform almost any function within a module, and many from different modules in the middle of performing an operation. However, there is a logical system of error messages and functionality that requires the user to perform certain functions before other functions can be attempted. This structure is detailed in the functional description of the workstations.

Supporting Subsystems

The following paragraph will detail the subsystems that are required to operate and support the automated TOC workstations. The method of transport and vehicular support for the Automated BN TOC would normally play an integral part in the specification for the BN TOC. However, this is not discussed within this documentation as it is not required within CCTB for the system to function. The BN TOC workstations do require subsystem support in order to portray the information exchange required of the system. The BN TOC workstations provide the interface to integrate inputs from the SINCGARS and POSNAV systems.

SINCGARS

Simulated SINCGARS radios are currently used to send both digital and voice transmissions. The radio system is fully integrated with the BN TOC workstations and the TOC local area

network. All reports, messages, and overlays can be sent out through the radio system.

POSNAV

The POSNAV system is a key component to the BN TOC. The POSNAV system is embedded within the workstation's interface. All POSNAV data is displayed on the Map Display at each of the workstations. The POSNAV system provides up-to-date position locations for all deployed vehicular elements and a terrain data base for the workstations. Manipulation of the terrain data base within the BN TOC workstations allow users to rapidly perform operations normally conducted on standard military topographic maps.

Data Capture and Instrumentation

A primary purpose for developing a simulation-based prototype of an automated command and control system is to assess soldier performance as a function of this developmental system. The ability to automatically capture data for C² activities allows for instant recording of soldier performance and utilization patterns, comparing automated and non-automated performance, predicting training requirements, and documenting operational effectiveness as a function of the system and the soldier's use of the system.

A primary requirement was that the Bn TOC components be fully instrumented. Instrumentation includes automatic recording of user inputs and activities associated with system utilization. More specifically, this includes user activation of system functions such as the time that an overlay, report, or message is sent out. Instrumentation supports the development of summary indices of user inputs by activity type, function, and sub-function. Through instrumentation, C² performance within the simulation-based C² system is retained in a manner that allows researchers and developers to relate system-based activities with simulation-based activities. This allows events to be reconstructed to help determine the "how and why" of users' actions and relate different performances. Investigators of the new system can then use the user performances to determine the utility of the new system or make improvements to the system.

Map Characteristics

The following section details some of the general functional characteristics of the Map Display. It includes manipulating maps and graphics.

Discrimination

The system presents standard map information and control measures in such a manner that highlights and clearly discriminates terrain, graphical control measures, friendly units,

and enemy units. The map colors are displayed in the standard five map colors: Blue - Rivers, Green - Vegetation, Black - Man-made objects, Red - Roads, and Brown - Relief. The map display is capable of displaying land contour, rivers, roads, vegetation, and map grid lines. The display of the map area is consistent with military paper maps according to FM 21-26 (1988), "Map Reading".

Scaling

On the Map Display, standard military map scales of 1:25,000, 1:50,000, and 1:250,000 are available. Also, a non-standard scale of 1:125,000 is available so there is not such a large jump in scale between the 1:50,000 and 1:250,000 maps. The 1:50,000 scale shows the desired detail but not the desired area while the 1:250,000 scale shows the desired area but not in enough detail. The 1:125,000 scale bridges the gap between these two scales. Map, unit, and graphic control measure symbology are scalable with respect to the map scale selected for the system. All posted graphical control measures and unit symbols (both friendly and enemy) automatically rescale in direct relation to changes in map scales. Unit symbols and POSNAV displayed icons automatically aggregate to different unit levels when the scale of the map is changed.

Map Movement

The map on the Map Display can be positioned either through the use of scroll bars displayed on the right and bottom borders of the map or by dragging the map to the desired location. This allows the workstation user to position the map in the desired location for the current activity being conducted. The map can also be moved to a default location when the grid location for the BN TOC is entered into the system. With this option, the map is repositioned on the Map Display so that the BN TOC location is moved to the center of the Map Display.

Control Measures

Control Measures are defined as "directives given graphically or orally by a commander to subordinate commands in order to assign responsibilities, coordinate fires and maneuver, and to control combat operations." (FM 101-5-1, 1985, p. 1-19) A very important feature of the BN TOC workstation is its ability to depict and update graphical control measures. This is some of the most critical information available for users of the workstations, because the TOC is responsible for providing these controls to deployed units. The ability to easily create and send out control measures avoids the time consuming and difficult process of having subordinate units come to the TOC to receive a hard copy of the operational graphics. The TOC operators can display the graphical control measures in either black or red. Some examples of different control measures are: boundaries, objectives, coordination points, and contact points.

Icons

Icons are graphic representations of information from which one can view and discern information. Icons are posted to the Map Display in two colors: red and blue. Red is for enemy unit information and blue is for friendly units. Figure 2 shows the distinct set of icons used to display both the friendly and enemy information.

The system also gives the workstation user an indication of where icons or graphics are located; however, they cannot be displayed on the map due to viewing limitations on the screen. These indications appear as red and blue arrowheads for pointing to the graphic or icon. Red is for enemy related information and blue is for friendly.

Posted icons also retain a link to their source report or unit. The report or unit is the method by which the icon appears on the screen. If the icon is POSNAV generated, the displayed icon retains a link to this information. If the icon is report generated, then the icon retains a link to the report associated with it. Through this link, the report or unit associated with the icon can be recalled from the icon and displayed on the Map Display.

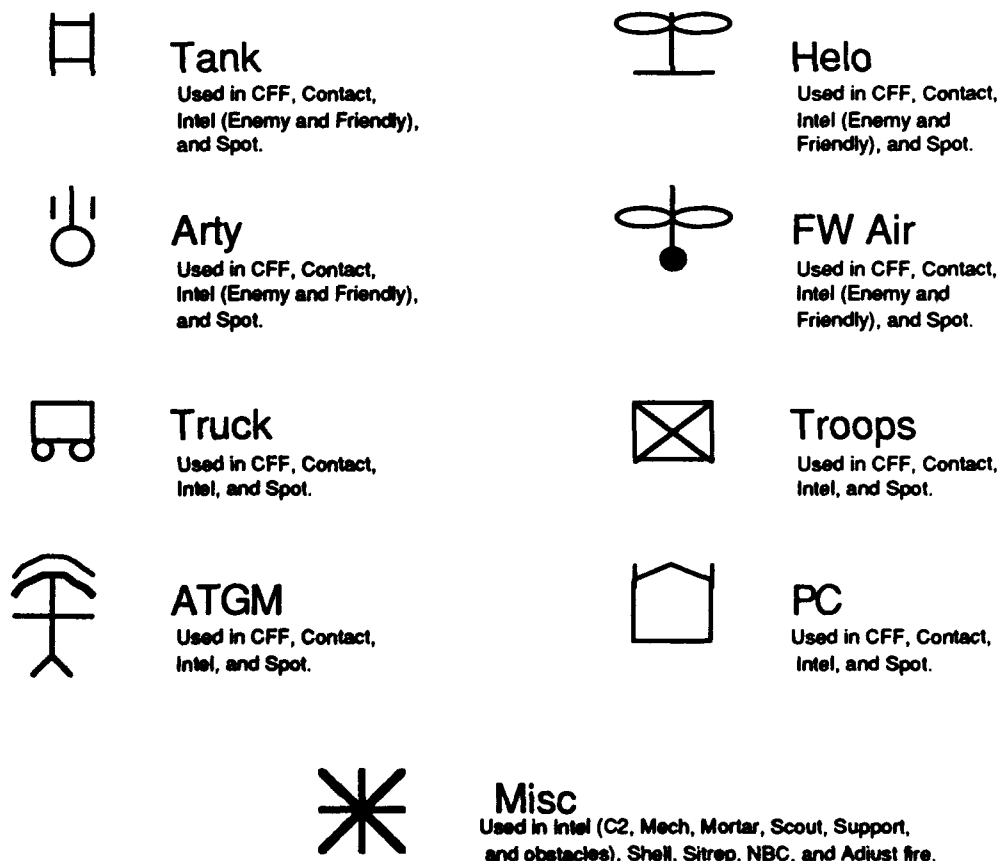


Figure 2. Icons

Reports

Reports available on the Communication and Planning Display are standardized reports based on current Army report formats (FM 101-5, 1984, Appendix B). The reports on the BN TOC workstations include the same information as on the vehicle-based CVCC reports. However, the format and manner in which report data is entered is different. The BN TOC workstation allows the complete report to be viewed and uses pulldown windows for report data entry.

Formats

The planning formats available on the Communication and Planning Display are also standardized formats based on current Army formats (FM 101-5, 1984, Appendix G). These formats consist of specific reports for both the S2 and S3. S2 formats are as follows: AnalAreaOpns (Analysis of Area of Operations), Collection (Collection Plan), IntelEst (Intelligence Estimate), and PerInt (Periodic Intelligence Report). S3 formats are as follows: EST/Sit (Estimate of the Situation), OpnsOrd (Operations Order), OpnSit (Operational Situation Report), PerOpnRpt (Periodic Operation Report), and RoadMvt (Road Movement Order). These formats can be found in FM 101-5 "Staff Organization and Operations".

The above sections have detailed the general functionality of the BN TOC workstations. The next section will go into the detailed functionality of how the workstations work and the specific operations that can be performed.

Detailed Description of BN TOC Workstation Functionality

Conventions

The following are the conventions used in the detailed description of the BN TOC workstation functionality. These conventions refer to the written description of the functionality used to describe the system.

In the written description, the following conventions are used:

- Names of options, functions, windows, buttons or fields have the first letter of each word in the name capitalized if they are not in a list (e.g. Where field, Route window, Cancel).

- Screen names only have the first letter of each word in the name capitalized (e.g., Build and Edit Overlays Screen, Format Module, etc.).

- Within the written description, a series of flow charts are referenced. The references are to figures found in Appendix A.

Functional Description of the BN TOC Workstation

The following sections relate the user interface screens to the functional description of the BN TOC Workstation. The descriptions are laid out in the following manner: First, there is a written description of the screen or functions. This is followed by figures of the screens as they appear when paging through them. Finally, a series of flow charts show the functionality of the screen or function.

Main System Level

Within this documentation, the Main System Level is used to show the flexibility of the system. Figure A-1 shows that options on either of the two screens or any of the software modules are available.

Figure 3 shows the layout of the map module on the Map Display and Figure 4 shows the Message and Format Modules on the Communication and Planning Display. The workstation user can make a selection within the same software module, on a different software module on the same screen, or on a different software module on the alternate screen at this level. Whenever the cursor is moved to a different module, the color of the window changes to indicate which window is being controlled by the cursor. Figure A-1 shows the flow of operations at the system level. The color changes stated in Figure A-1 are consistent for any operations that are performed within a module.

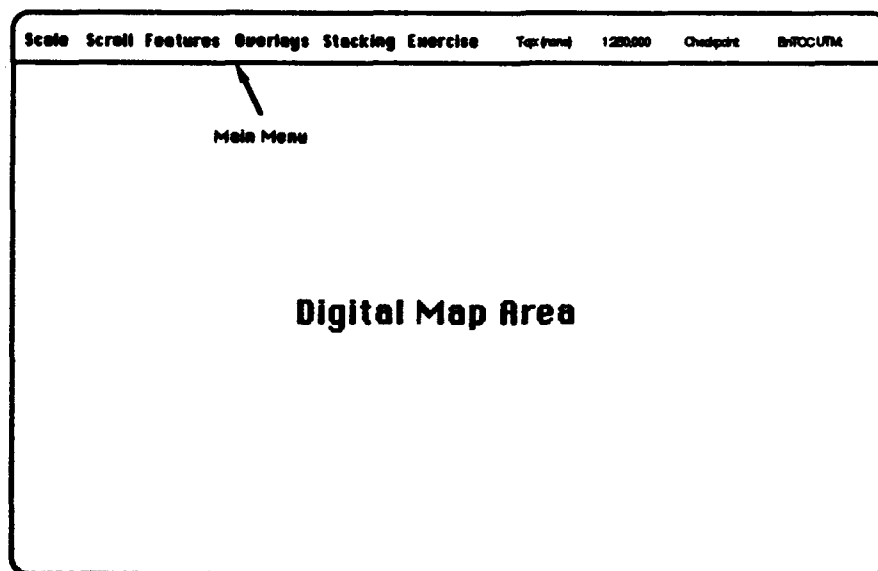


Figure 3. Map Display

Infolder/Folder

The purpose of the Infolder and subsets of the the Infolder, is to handle all message actions whether it be composing, sending, filing, or reading reports. Folders also provide the TOC operator a way of organizing reports for different operations. The folder operations are analogous to using an Electronic Mail (E-mail) system. Just like an E-mail system, messages can be filled out, filed in folders (directories), sent out to single or multiple stations (addresses), and also be read when received.

There are four different levels of functions that can occur from either the Infolder or other message folders. The four levels are: Infolder Main Menu, View Messages Menu, Dispose of Messages Menu, and Close. No folder, including the Infolder has all four levels. The Infolder (Figure 4) can perform all functions on all menus except Close. The Infolder is the only folder that cannot be closed or deleted and is the only folder that can access the Infolder Main Menu. All other folders are accessed through the Infolder Main Menu. If Close is available on a folder, then it is located below the Dispose of Messages window. When that option is selected, the folder disappears off of the Communication and Planning Display. Figure A-2 shows the flow of operations on folders at the different menu levels.

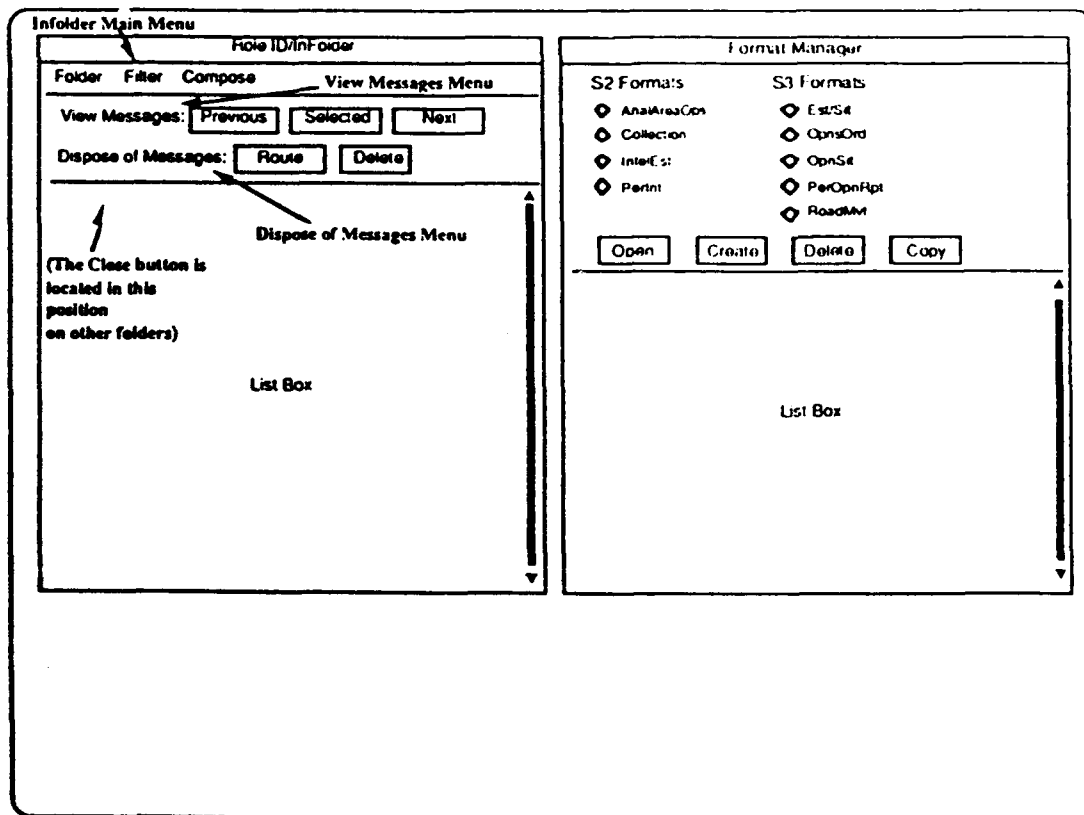


Figure 4. Communication and Planning Display

Infolder Main Menu

The purpose of the Infolder Main Level is to provide access to other folders (either standard or created), set message filters, and compose messages.

The Infolder Main Menu is located at the top of the Infolder as shown in Figure 4. There are three options that are available from this menu: Folder, Filter, and Compose. Selections are made from this menu by moving the mouse to the desired option and pressing the left mouse button. This causes a pulldown window to appear under the selected option.

The Folder option allows access to other folders on that workstation. The Filter option is used to set the receive filter on the workstation allowing only certain messages to be received. The Compose option is used to compose standard military reports. These options and pulldown windows will be discussed in greater detail in the following sections. Figure A-3 shows the flow of operations from the Infolder Main Menu.

Message Folder

The purpose of the Message folder is to provide the workstation user with a capability to keep an orderly filing system of all reports that are received by the workstation. The user can either use standard folders or make a custom filing system to perform this organization.

Message folders are accessed through the Folder option of the Infolder Main Menu. Figure 5 shows the pulldown window associated with the Folder option when Folder is selected. The options available are: Journal, MapDisp, SitDisp, Workbook..., and Remote...

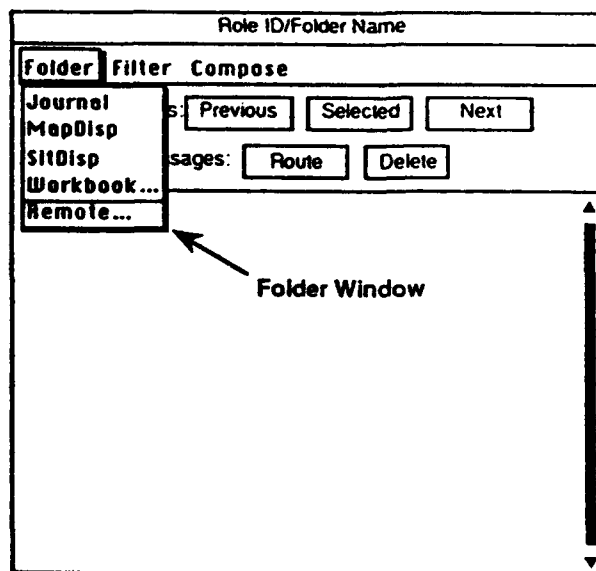


Figure 5. Folder Window

Journal, MapDisp, and SitDisp are three standard folders within the Infolder that cannot be deleted. Selecting one of these options brings up the associated folder. These three folders have the same functionality as others with the exception of the Journal. Messages that are posted to the Journal cannot be deleted.

When Workbook is selected, the Workbook window is displayed (Figure 6). The window is used to create, delete, and view workbook sections. Within this window, workbook sections are displayed on a scrollable list. This list includes a set of standard workbook sections that cannot be deleted. These sections are: Air, Armor, Artillery, Infantry, Miscellaneous, and NBC. Any created workbook sections are also displayed on this list. Created workbook sections perform as folders yet they can be deleted.

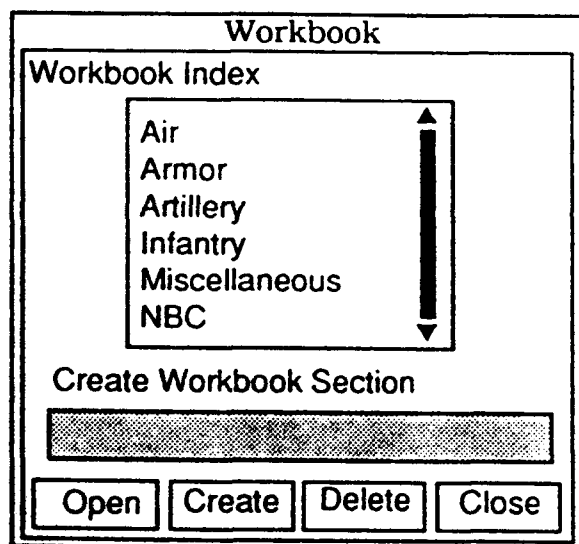


Figure 6. Workbook Window

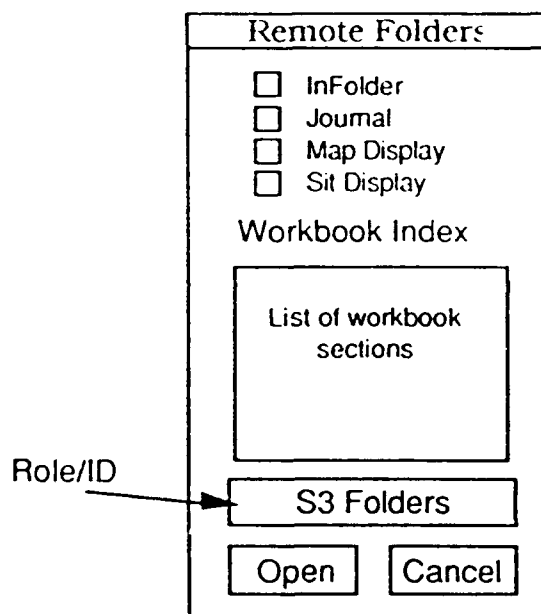


Figure 7. Remote Window

When the operator selects Remote, the Remote window is displayed, as shown in Figure 7. Remote allows the workstation operator to access the folders and workbook sections of other workstations that are located on the BN TOC local area network.

Figures A-4 through A-11 show the flow of folder operations from the Infolder Main Menu.

Filter Message

The purpose of the Filter function is to allow the workstation operator to receive only those reports that he/she needs to accomplish the mission. Setting the message filter also

ensures that the message list is usable and not cumbersome in the execution of the TOC's mission. For example, the S2 may set the receive filter so that Situation Reports (SitReps) are not received at the S2 workstation. While the SitRep is an important report, it is important to the S3 and not the S2. Having these reports appear on the S2 workstation is undesirable because they are of no use to the S2.

The Filter function is found on the Infolder Main Menu. Selecting this option causes the Filter window, as shown in Figure 8, to appear. The options available from this window are: Sort Messages and Receive Filters. The Sort Messages option is not operational at this time.

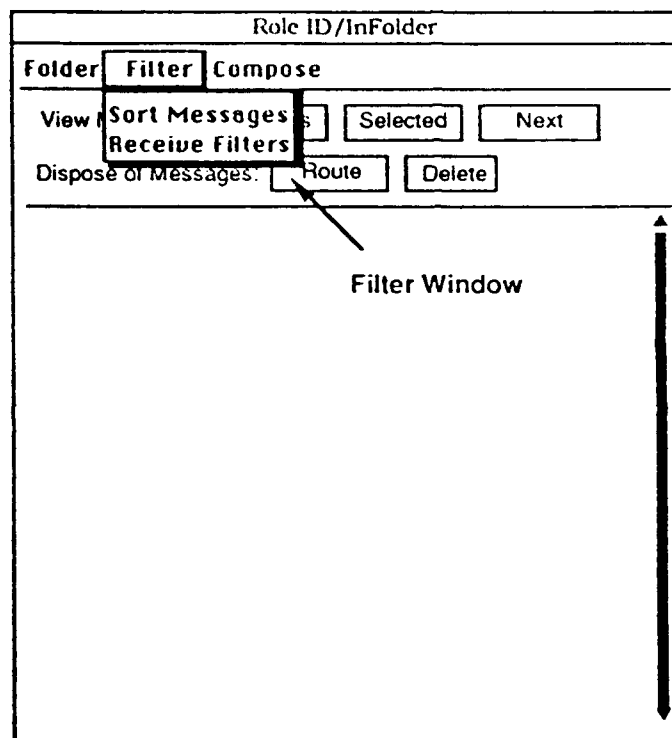
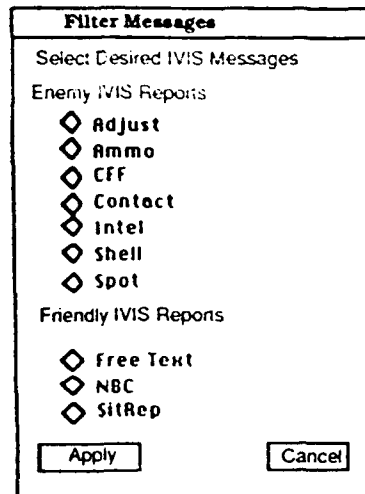


Figure 8. Filter Window

When the operator selects Receive Filter from the Filter window, the Filter Messages window (as shown in Figure 9) appears. In this window, the operator selects the messages he/she wants to receive. Once the workstation operator has selected the desired messages to filter, the filter must be applied to the system so that the workstation can properly pass the messages. Once the filter is applied, only the messages selected to be received will be displayed on the workstation. Those messages selected to be filtered out will not appear in the workstations Infolder. Figure A-12 shows the flow of filter operations from the Infolder Main Menu.



Filter Messages

Select Desired IVIS Messages

Enemy IVIS Reports

- ☐ Adjust
- ☐ Ammo
- ☐ CFF
- ☐ Contact
- ☐ Intel
- ☐ Shell
- ☐ Spot

Friendly IVIS Reports

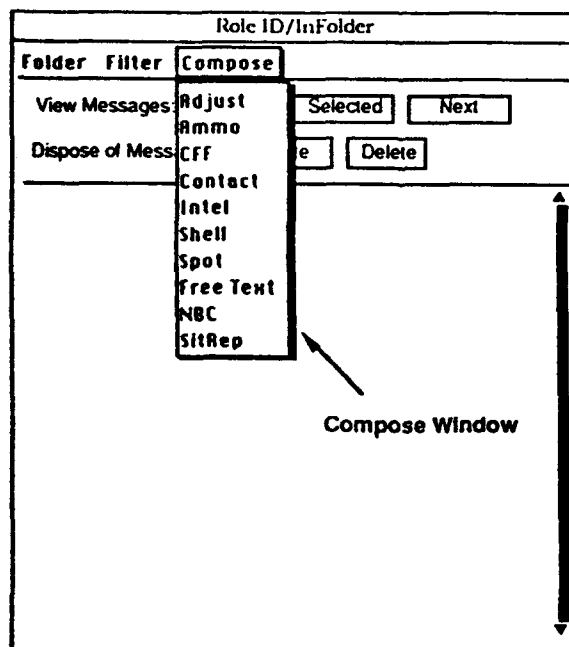
- ☐ Free Text
- ☐ NBC
- ☐ SitRep

Figure 9. Filter Messages Window

Compose Message

The purpose of the Compose function is to provide the workstation operator with the capability to develop or compose reports and messages that can be transmitted digitally to vehicles within the battalion.

Compose is a function found on the InFolder Main Menu. When an operator selects this option, the Compose pulldown window (shown in Figure 10) appears. The options available from this window are: Adjust, Ammo, CFF (Call for Fire), Contact, Intel, Shell, Spot, Free Text, NBC, and SitRep.



Role ID/InFolder

Folder	Filter	Compose
View Messages	Adjust	<input type="button" value="Selected"/> <input type="button" value="Next"/>
Dispose of Mess	Ammo	<input type="button" value="e"/> <input type="button" value="Delete"/>
	CFF	
	Contact	
	Intel	
	Shell	
	Spot	
	Free Text	
	NBC	
	SitRep	

Compose Window

Figure 10. Compose Window

When the operator selects a type of report to compose, that particular report window will appear as shown in Figures 11-20. The report can then be filled out, edited, and transmitted by using the mouse and keyboard on the workstations to other stations. The reports are compatible with the reports developed for the vehicle based CVCC system. LaVine (1991) documents the options and manner of filling out reports on the vehicle based CVCC system. Figure A-13 shows the flow of composing messages from the Infolder Main Menu.

Message Composer	
Adjust FireReport	
Target	<input type="text"/>
-OR-	
L/R Shift	<input type="text"/>
A/D Shift	<input type="text"/>
<input type="checkbox"/> FFE <input type="checkbox"/> EOM	
Originator	<input type="text"/>
<input type="button" value="Route"/>	<input type="button" value="Cancel"/>

Figure 11. Adjust Fire Report

Message Composer	
Ammo Report	
Ammo	Status
Heat	<input type="text"/>
Sabot	<input type="text"/>
50	<input type="text"/>
7.62	<input type="text"/>
Smoke	<input type="text"/>
Originator	<input type="text"/>
<input type="button" value="Route"/>	<input type="button" value="Cancel"/>

Figure 12. Ammo Report

Message Composer	
Suppression Report	
What	Where
<input type="text"/>	<input type="text"/>
Originator <input type="text"/>	
<input type="button" value="Route"/>	<input type="button" value="Cancel"/>

Figure 13. Call for Fire Report

Message Composer	
Contact Report	
What	Where
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
Originator <input type="text"/>	
<input type="button" value="Route"/>	<input type="button" value="Cancel"/>

Figure 14. Contact Report

Message Composer		
Intelligence Report		
	Enemy	Friendly
What	<input type="text"/>	<input type="text"/>
Where	<input type="text"/>	<input type="text"/>
Number	<input type="text"/>	<input type="text"/>
Activity	<input type="text"/>	<input type="text"/>
Heading	<input type="text"/>	<input type="text"/>
Obstacle Unit		
What	<input type="text"/>	<input type="text"/>
Where	<input type="text"/>	<input type="text"/>
Where	<input type="text"/>	<input type="text"/>
As Of <input type="text"/>		
Originator <input type="text"/>		
<input type="button" value="Route"/>		<input type="button" value="Cancel"/>

Figure 15. Intelligence Report

Message Composer	
Shell Report	
Number	Where
<input type="text"/>	<input type="text"/>
As Of	<input type="text"/>
Originator	<input type="text"/>
<input type="button" value="Route"/>	<input type="button" value="Cancel"/>

Figure 16. Shell Report

Message Composer		
Spot Report		
What	Observed	Destroyed
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
Where	<input type="text"/>	
Heading	<input type="text"/>	
Enemy Action	<input type="text"/>	
Own Action	<input type="text"/>	
As of	<input type="text"/>	
Originator	<input type="text"/>	
<input type="button" value="Route"/>		<input type="button" value="Cancel"/>

Figure 17. Spot Report

Message Composer	
Free Text	
<div style="border: 1px solid black; height: 150px; width: 100%; position: relative;"> <div style="position: absolute; right: -10px; top: 0; bottom: 0; width: 5px; background: linear-gradient(to bottom, black 49%, transparent 49%, transparent 51%, black 51%);"></div> </div>	
Originator	<input type="text"/>
<input type="button" value="Route"/>	<input type="button" value="Cancel"/>

Figure 18. Free Text Message

Message Composer	
NBC Report	
Obs Loc	<input type="text"/>
Atk Loc	<input type="text"/>
Burst	<input type="text"/>
Attack	<input type="text"/>
Flash/Bang Time	<input type="text"/>
Number Shells	<input type="text"/>
Nuc Crtr Diam (m)	<input type="text"/>
Nuc Cloud Wi (deg)	<input type="text"/>
Nuc Cloud Hi (deg)	<input type="text"/>
Originator	<input type="text"/>
<input type="button" value="Route"/>	<input type="button" value="Cancel"/>

Figure 19. NBC Report

Message Composer	
Situation Report	
As Of	<input type="text"/>
FLOT	<input type="text"/>
Enemy Activity	<input type="text"/>
Enemy Act Level	<input type="text"/>
Crit Short	
<input type="checkbox"/> Pers	
<input type="checkbox"/> Ammo	
<input type="checkbox"/> Fuel	
<input type="checkbox"/> Equip	
Cdr's Intent	<input type="text"/>
Originator	<input type="text"/>
<input type="button" value="Route"/>	<input type="button" value="Cancel"/>

Figure 20. Situation Report

View Messages

The purpose of the View Messages function is to allow the workstation operator to display desired message(s) from the displayed message list. This list can be acquired either from the Infolder, another folder, or workbook section.

The View Messages menu, as shown in Figure 4, is available on all folders. This menu provides access, through it's three options, on what message is to be displayed. The three options available are: Previous, Selected, and Next. A message from the displayed list must first be selected, then viewed. Figures A-14 and A-15 show the operations associated with viewing messages from folders.

Dispose of Messages

The purpose of the Dispose of Messages function is to allow the operator to file, transmit, and delete messages from the folder's message list. This allows the workstation user to continue work with message lists that are not cumbersome. It also allows him or her to retain messages that may be used at a later time.

The Dispose of Messages function, as shown in Figure 4, is available on all folders. Through it's two options, this function allows messages to be filed, sent, and deleted. The two options available are: Route and Delete.

The delete option is not available in the Journal Folder. Once messages are posted to this folder, they cannot be deleted. This is because the Journal is considered a historical document of everything that takes place within the TOC. Once something is posted to the Journal, it remains as a permanent record of what has happened.

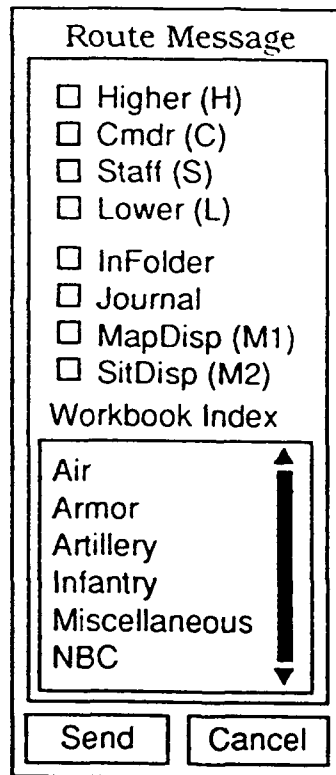
In order for a message to be disposed, the workstation operator must first select a message from the displayed list. When the operator selects Delete, any highlighted messages are deleted and removed from the message list.

When Route is selected, the Route window appears. The Route Message section details the procedures associated with this function. Figure A-16 shows the functions associated with disposing of messages.

Route Message

The purpose of the Route Message function is to provide the workstation user with the capability to both send and file messages that have been received from others or composed by himself.

This function is accessed either through the Route option on the Dispose of Messages menu in a folder or from a specific report's menu from the Compose function. See either the Dispose of Messages or Compose Message sections of this report for the details of these functions. From either function, when the operator selects Route, the Route Window (as shown in Figure 21) appears. This window allows the selected message to be transmitted to a variety of locations either to be filed there or sent to another station. The standard stations and folders that reports can be sent to are Higher, Commander, Staff, Lower, InFolder, Journal Map Display, and Situation Display. Also, messages can be routed to the standard workbook sections along with any sections created by the user. Figure A-17 and A-18 show the operations and system actions associated with the Route function.



The image shows a 'Route Message' dialog box. It has a title bar 'Route Message'. Inside, there is a list of checkboxes for routing options: 'Higher (H)', 'Cmdr (C)', 'Staff (S)', 'Lower (L)', 'InFolder', 'Journal', 'MapDisp (M1)', and 'SitDisp (M2)'. Below these is a section titled 'Workbook Index' which contains a list box with the following items: 'Air', 'Armor', 'Artillery', 'Infantry', 'Miscellaneous', and 'NBC'. To the right of the list box is a vertical scrollbar. At the bottom of the dialog are two buttons: 'Send' and 'Cancel'.

Route Message	
<input type="checkbox"/> Higher (H)	
<input type="checkbox"/> Cmdr (C)	
<input type="checkbox"/> Staff (S)	
<input type="checkbox"/> Lower (L)	
<input type="checkbox"/> InFolder	
<input type="checkbox"/> Journal	
<input type="checkbox"/> MapDisp (M1)	
<input type="checkbox"/> SitDisp (M2)	
Workbook Index	
Air	↑ ↓
Armor	
Artillery	
Infantry	
Miscellaneous	
NBC	
Send	Cancel

Figure 21. Route Window

Format Module

The Format Module allows the operator to create standard Army report formats as shown in FM 101-5 "Staff Organization and Operations". These formats are used by tactical units in the planning of future operations and actions.

The Format Module (Figure 4) consists of a listing of report formats available along with a listing area for created formats. The formats available are: S2-Analysis of the Area of Operations, Collection Plan, Intelligence Estimate, and Periodic Intelligence Report, S3-Operational Estimate of the Situation, Operations Order, Operational Situation Report, Periodic Operations Report, and Road Movement Order.

The formats for both the S2 and S3 workstations can be displayed on either the S2 or S3 workstation. However, only the report formats for the specific workstation can be created or edited. The report formats for the alternate workstation can only be viewed. An example of this is that the S2 can create an Intelligence Estimate on his workstation, but the S3 can only view this on his workstation. The reverse is also true with respect to the S3 being able to create Operations Order on his workstation and the S2 can only view the order on his workstation.

The functions available from the Format Module are: Open, Create, Delete, and Copy. Figure A-19 shows the flow of operations of the Format Module.

Open Report Format

The purpose of the Open Report Format function is to allow the operator to view or edit a desired report format.

The Open Report Format function is selected from the Format Module shown in Figure 4. The operator must first select a format type and a format from the displayed format list. When Open is selected, that report format is opened. Formats for each specific type of workstation (i.e. S2 or S3) can be edited. Formats from the alternate workstation cannot be edited.

Figures 22 and 23 show the opened formats for like and alternate workstations respectively. Once opened, the format can be either viewed or edited. Figure A-20 shows the functioning of the Open Report Format function.

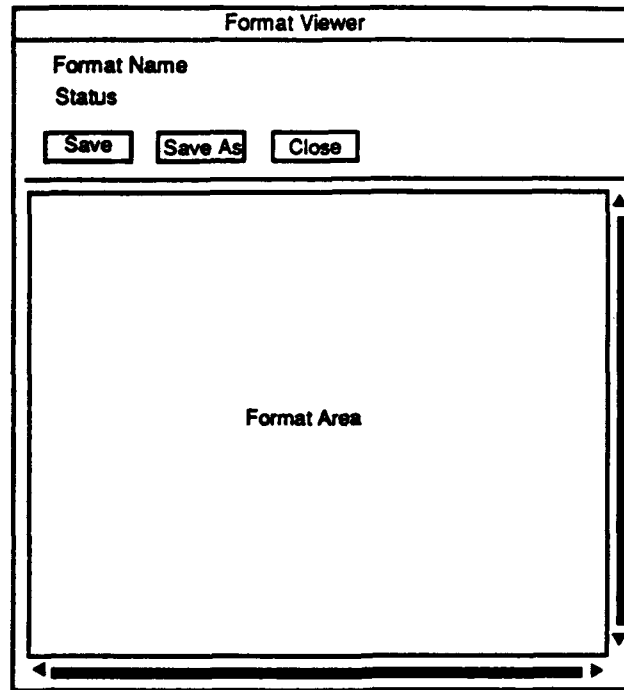


Figure 22. Like Format Viewer

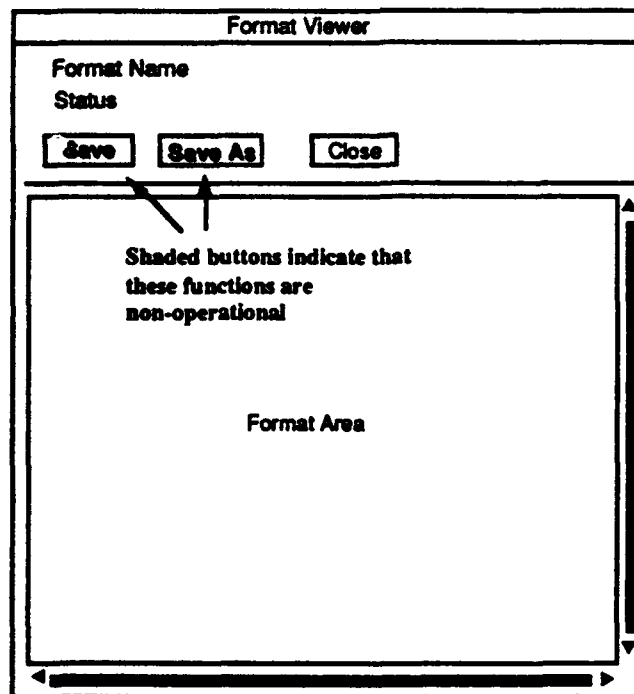


Figure 23. Alternate Workstation Viewer

Create Report Format

The purpose of the Create Report Format function is to provide the workstation user the capability to create new and mission-specific planning reports and estimates.

The user first selects the type of format desired on the Format Module. Then, the user selects the Create Report Format function from the Format Module shown in Figure 4. When Create is selected, the Create Report window appears, as shown in Figure 24. The options available on this window are: Close, Create, and typing or editing a report format name. Once the format name is entered and Create is selected, a blank report format for the type of report format selected, is displayed. FM 101-5 "Staff Organization and Operations" shows the formats for the type of report format selected. Figures A-21 and A-22 show the flow of operations associated with the Create Report Format function.

Create Report Format

New Report Name

Create Cancel

Figure 24. Create Report Window

Delete Report Format

The purpose of the Delete Report Format function is to give the workstation user the capability to delete unnecessary report formats from the workstation.

The Delete Report Format function is selected from the Format Module shown in Figure 4. The user then selects a report format from the displayed list. When Delete is selected, confirmation is requested from the user to delete this report. When the user provides an affirmative response, the system deletes the selected report. Figure A-23 shows the flow of operations associated with the Delete Report Format function.

Copy Report Format

The purpose of the Copy Report Format function is to provide the workstation operator the capability to copy a selected report format and rename it. This function would most likely be used to copy a report format and then edit it for a different operation such as a contingency operation.

The operator selects Copy Report Format function from the Format Module (shown in Figure 4). In order for this function to work, the operator must select a report format from the displayed list. When the Copy function is selected, the Copy Format window appears, as shown in Figure 25. The options available on this window are: Cancel, Copy, and typing or editing a format name. Once the format name is entered and Copy is selected, the newly named format is added to the format list. Figures A-24 and A-25 show the flow of operations associated with the Copy Report Format function.

Copy to New Report Name

New Report Name

Copy Cancel

Figure 25. Copy Format Window

Edit Function

The Edit function is available to the workstation user when a blank report format is open, or when a previously created report format is open. There is only a limited capability to edit report formats built into the system. Basically, text can only be inserted and deleted within the format. Text is inserted by moving the cursor to the desired location within the report and then typing the desired text. Text is deleted by dragging the cursor over the text the user wants to delete and then pressing the delete button on the keyboard. Figure A-26 shows the flow of operations when editing a format.

Save Function

The purpose of the Save function is to allow the workstation operator to save a created or edited report format. Within the system, any report that is created or edited is not automatically saved. The operator must insure that he/she saves the report. If a report format is created or edited and not saved, the edits made are not saved.

The Save function is available when a blank report format or a previously created format is open, as shown in Figure 22. When the operator selects the Save function, he/she saves the changes and edits made to the displayed report format under it's current file name. Figure A-27 shows the flow of operations for the Save function.

Save As Function

The purpose of the Save As function is to allow the workstation user to save an edited report format under a different name than the original so that the original report can remain in the report list unchanged. This function could also be used when contingency operations need to be planned. The user can develop the initial Operations Order. Then, by editing the original order to include the contingency operation and using the Save As function, both reports remain within the workstation for use.

The Save As function is available when a blank report format is open, or when a previously created report format is open (See Figure 22). When the user selects Save As, the Save As window (shown in Figure 26) appears. The options available on this window are: Cancel, Save As, and type or editing a format name. Once the new name is typed in and Save As selected, the edited format is saved under the new name. The original format remains in its original condition. Figures A-28 and A-29 show the flow of operations for the Save As Format function.

Save As

New Report Name

Save As Cancel

Figure 26. Save As Window

Map Screen

The Map Screen contains the system level functions for the Map Display. This level allows the workstation user to interface with the different functions available on the Map Display.

The Map Screen shown in Figure 3 allows the workstation user to gain access and manipulate the functionality of the Map Display. The Map Screen has a main menu bar at its screen top with the following function options: Scale, Scroll, Features, Overlays, Stacking, and Exercise. These functions allow the workstation user to move and display map information, manipulate overlays, and control exercises being conducted on the CCTB network. The Exercise option is only available on a workstation that is initiated or powered up as a Coordinator Workstation.

Other functions that can be conducted from the Map Screen are: selecting displayed icons, using displayed scroll bars, and dragging the map to display different portions of the digital map. The Scroll Bar and Drag functions are available when the user selects them from the first set of functions. Figure A-30 shows the functioning of operations at the Map Screen level on the Map Display.

Scale Operations

The purpose of the Scale function is to allow the workstation user to change the scale of the displayed digital map to a scale that suits the current needs of the user. For example, the S3 may need to have the map at the 1:50,000 scale to review the deployment of the battalion, but the scale has to be changed to 1:125,000 to review the battalion's deployment with respect to the parent brigade.

The user selects the Scale function from the main menu bar of the Map Screen shown in Figure 3. When selected, the Scale window, as shown in Figure 27, is displayed. The options available on this window are: 1:25,000, 1:50,000, 1:125,000, and 1:250,000. When the desired scale is selected, the displayed digital map will change to the newly selected scale. Figure A-31 shows the functioning of the Scale Operations.

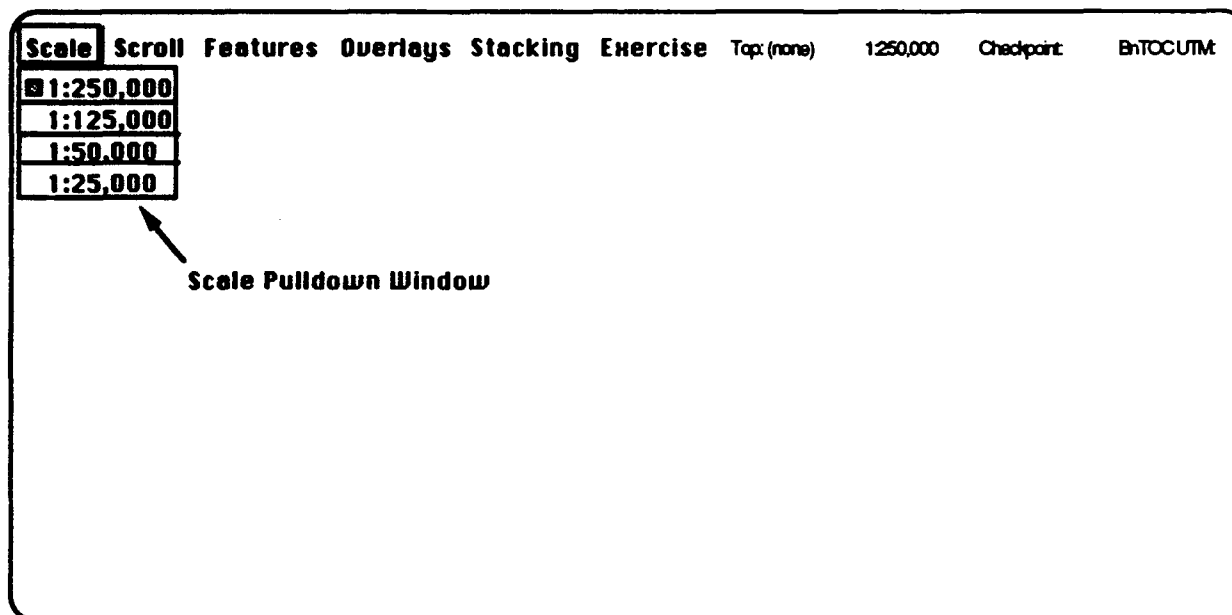


Figure 27. Scale Window

Scroll Operations

The purpose of the Scroll function is to allow the workstation operator to select the manner in which the map can be moved around on the Map Display. This allows the operator to position the digital map on the display so that the mission can be planned or executed easily and effectively.

The operator selects the Scroll function from the main menu bar of the Map Screen shown in Figure 3. When the scroll feature is selected, the Scroll window as shown in Figure 28 is displayed. The options available on this window are: Home, Scroll Bars, and Turn Drag On/Turn Drag Off.

The Home function repositions the map so that the location designated as the BN TOC UTM Grid is placed in the center of the Map Display. (The Exercise Operations section details this function.) The Scroll Bars function enables and disables the displayed scroll bars. If scroll bars, as shown in Figure 28, are displayed on the Map Screen, they are active. The Turn Drag On/Turn Drag Off function respectively enables and disables the cursor from being in the drag mode when on the digital map. The Turn Drag Off option is available when the Drag is enabled, and Turn Drag On is available when the Drag is disabled. When Drag is enabled, the cursor is active when on the digital map. Pressing the left mouse button with the cursor on the digital map, moving the cursor, and releasing the mouse button causes the map to be repositioned such that the map location selected moves to the location where the mouse button was released. This allows the workstation user to position the digital map so that it can be

viewed in the desired location. Figures A-32 through A-36 show the functioning of the Scroll Operations.

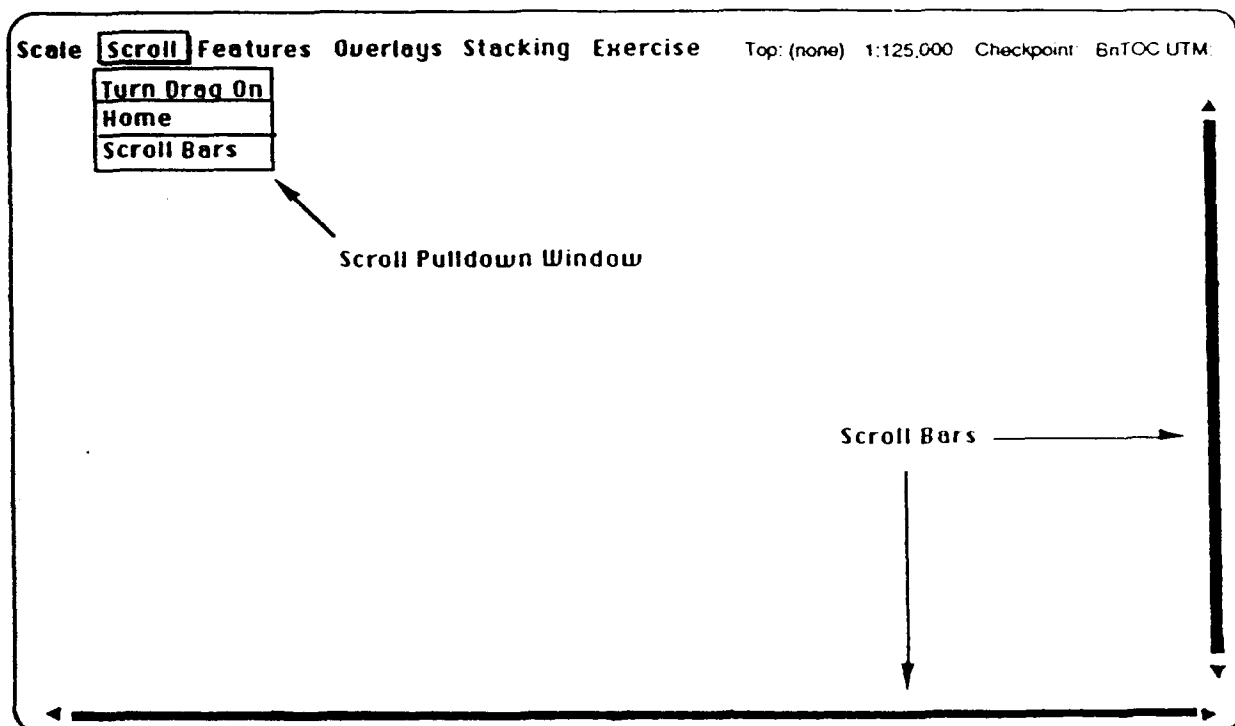


Figure 28. Scroll Window

Features

The purpose of the Features function is to allow the workstation user to display the map features desired onto the Map Display. This can help declutter the digital map and also allows the user to tailor the digital map to his/her desired features.

The user selects the Features function from the main menu bar of the Map Screen shown in Figure 3. When selected, the Features window (shown in Figure 29) is displayed. The options available on this window are: Contour lines, Grid Lines, Roads, Rivers, and Vegetation. Next to each option is a selection box. When the associated selection box is highlighted, that feature is displayed on the Map Screen. When the selection box is not highlighted, that feature is removed from the Map Screen. The user can select any combination of features to be displayed. Figure A-37 shows the operations associated with the Features function.

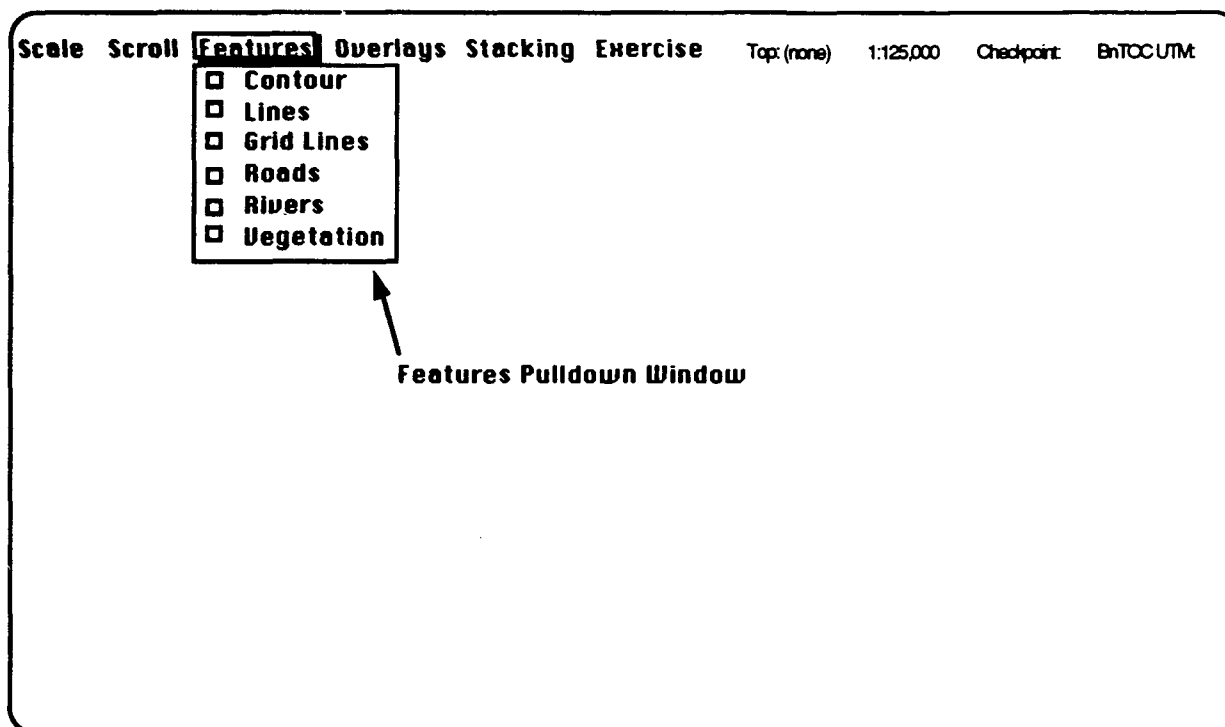


Figure 29. Features Window

Overlay Operations

The Overlay Operations functions provide the workstation operator with the capability to create, send, edit, copy, and delete overlays on the Map Display.

The operator selects the Overlay Operations functions from the main menu bar of the Map Screen shown in Figure 3. When selected, the Overlay pulldown window (shown in Figure 30) is displayed. The options available on this window are: Create, Edit, Send, Copy, Delete, and Hilite Top/Unhilite Top. These functions allow the workstation user to perform many required overlay operations within the Automated BN TOC. The Unhilite Top function is available when the top overlay is hilited, and Hilite Top is available when the top overlay is not hilited. Figure A-38 shows the flow to specific overlay operations.

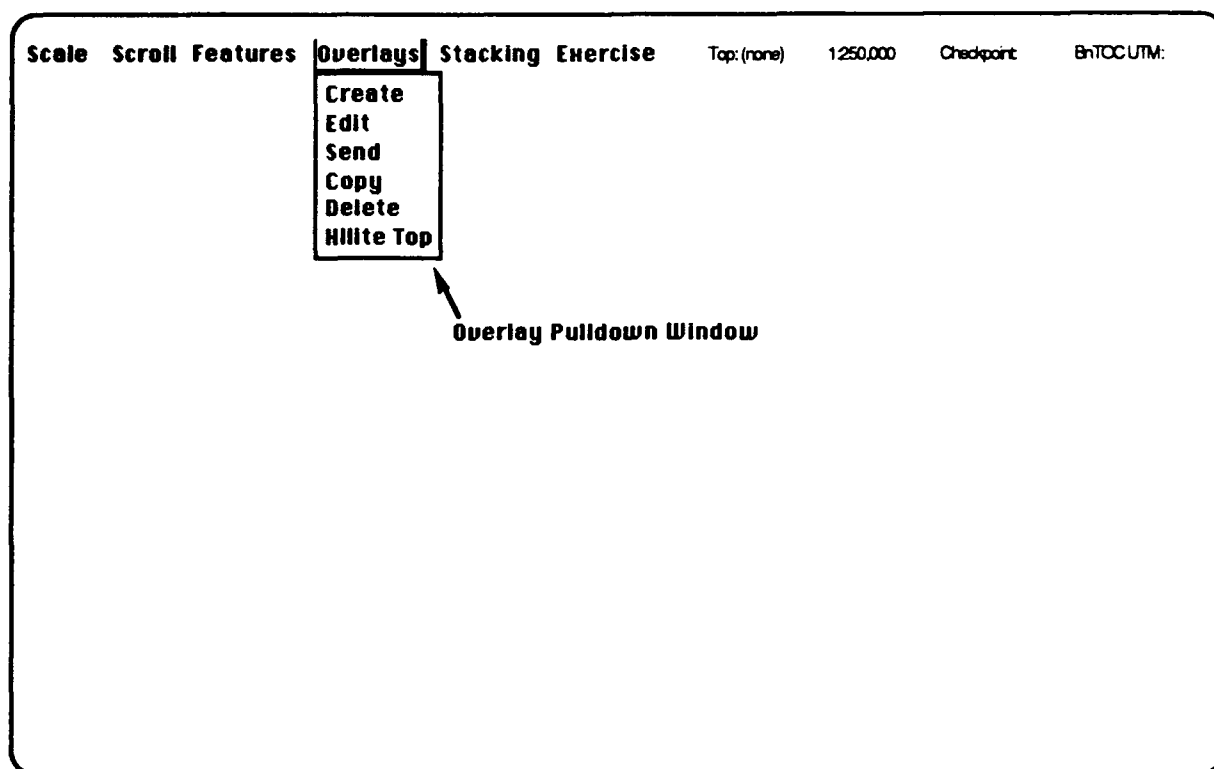


Figure 30. Overlay Pulldown Window

Create Overlay

The Create Overlay function allows the workstation user to create new overlays on the Automated BN TOC workstation. For example, the S2 would use this function if he/she were to develop a new enemy situation overlay.

The user selects Create from the Overlay pulldown window shown in Figure 30. When Create is selected, the Create Overlay window (shown in Figure 31) is displayed. The options available on this window are: Cancel, Create, and typing or editing a new overlay name. Once the user enters a name and selects Create, the Build and Edit Overlays Screen appears on the digital map of the Map Screen. The Build and Edit Overlays Screen section documents this functionality. Figures A-39 and A-40 show the flow of operations associated with creating an overlay.

Type Name of Overlay to Create:

New Overlay Name

Create Cancel

Figure 31. Create Overlay Window

Edit Overlay

The Edit Overlay function allows the workstation operator to edit and change existing overlays within the BN TOC system. An example of this is the TOC developing a FRAGO for a contingency operation in the same area of their current mission. The TOC can call up the current overlay and make the necessary changes by editing this overlay instead of creating a totally new overlay.

The operator selects the Edit Overlay function from the Overlay pulldown window shown in Figure 30. When Edit is selected, the Edit Overlay window (shown in Figure 32) is displayed. The Edit Overlay window displays a list of overlays available on that workstation and has three options that can be performed. The options available are: Cancel, Edit, and selecting an overlay from the displayed list. Once the operator selects an overlay from the list and then selects Edit, the Build and Edit Overlays Screen appears. The selected overlay appears in the edit mode on the digital map of the Map Screen. At this point, the overlay can be edited according to the Build and Edit Overlays Screen section. Figure A-41 shows the flow of operations associated with editing an existing overlay.

Overlay List Area

Edit Cancel

Figure 32. Edit Overlay Window

Send Overlay

The purpose of the Send Overlay function is to allow the workstation operator to transmit existing overlays to either deployed vehicles, other TOCs, or other workstations on the battalion command radio net. Taking the example presented above, when the FRAGO overlay developed is finished, it now needs to be transmitted to the required units. The Send Overlay function enables the overlay to be transmitted over the radio to the desired units.

The operator selects the Send Overlay function from the Overlay pulldown window shown in Figure 30. When Send is selected, the Send Overlay window (shown in Figure 33) is displayed. The Send Overlay window displays a list of overlays available on that workstation and has four options that can be performed. The options available are: Close, Send, selecting an overlay to send, and selecting a station to send the overlay. Once the operator selects an overlay, a location to send the overlay, and Send, then the selected overlay is sent out over the SINCGARS radio to the designated stations. Only one overlay can be sent at a time, but that overlay can be sent to multiple locations. Figures A-42 and A-43 show the flow of operations associated with sending an overlay to other stations.

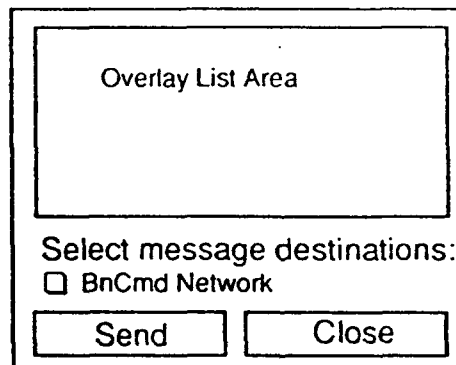


Figure 33. Send Overlay Window

Copy Overlay

The purpose of the Copy Overlay function is to allow the workstation user to copy an existing overlay either from the user's own workstation or another workstation. For example, the S2 might initially develop a template, based on doctrinal deployment, for a Motorized Rifle Battalion in the defense. He/she might then copy this overlay to a new mission-specific name, and then edit the mission-specific overlay.

The user selects the Copy Overlay function from the Overlay pulldown window shown in Figure 30. When Copy is selected, the Copy Overlay window (shown in Figure 34) is displayed. The Copy Overlay window displays a list of overlays available on the

selected workstation and has five options that can be performed. The options available are: Close, Copy, selecting a listing of overlays from a different workstation, selecting an overlay to be copied, and typing a name for the new overlay. Once the user selects the desired overlay to be copied, the name for the new overlay is typed, Copy is selected, then the selected overlay is copied to the new name. The overlay name is added to the workstations overlay list. Figures A-44 and A-45 show the flow of operations associated with copying an overlay.

Figure 34. Copy Overlay Window

Delete Overlay

The Delete Overlay function is used by the workstation operator to remove unwanted overlays from the overlay stack and Automated BN TOC system. This function could be used by the S2 or S3 after they completed their planning process for an upcoming mission. They may need to get rid of unneeded alternate course of action overlays to keep their overlay stack from becoming too cluttered.

The operator selects the Delete Overlay function from the Overlay pulldown window shown in Figure 30. When Delete is selected, the Delete Overlay window (shown in Figure 35) is displayed. The Delete Overlay window displays a list of overlays available on that workstation. The options that can be performed in this window are: Close, Delete, and selecting an overlay to be deleted from the displayed list. Once the operator selects the desired overlay to be deleted then selects Delete, a confirmation is requested from the operator to delete the selected overlay. Once an affirmative response is received, the selected overlay is deleted from the overlay list and system. Figures A-46 shows the flow of operations associated with deleting an overlay.

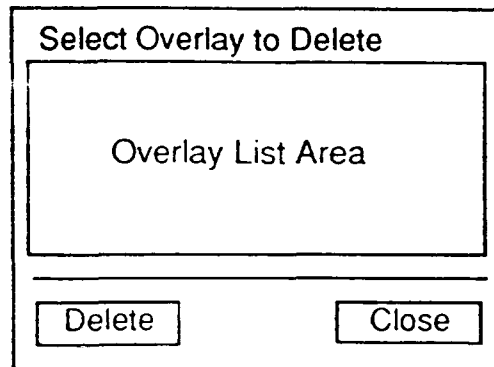


Figure 35. Delete Overlay Window

Hilite Top/Unhilite Top

The purpose of the Hilite Top/Unhilite Top function is to allow the workstation user to show which overlay is the top overlay on the Digital Map. Moving an overlay to the top of the order is explained in the Stacking Section below.

The user selects the Hilite Top/Unhilite Top functions from the Overlay pulldown window. Only one of these functions is active at a time. The functions toggle with respect to which function is active. Selecting one causes the other function to become active. When the user selects Hilite Top, the drawing points of the top overlay on the Digital Map are outlined with a black box. When Unhilite Top is selected, the boxes around the top overlay's drawing points are removed. Figure A-47 shows the flow of operations associated with highlighting and unhighlighting the top overlay on the Digital Map.

Stacking

The Stacking functions provide the workstation operator the capability to manipulate overlays. These functions include the posting and unposting of overlays to either the Map Screen or Situation Display and changing the stacking order of overlays that are posted to the Map Display. The S2 could use these functions to post his latest enemy situational template to the Situation Display. This would keep the Executive Officer up-to-date with the current enemy situation.

The operator selects the Stacking functions from the main menu bar of the Map Screen shown in Figure 3. When selected, the Stack pulldown window (shown in Figure 36) is displayed. The options available are: Post to Map, Unpost from Map, Unpost Top, Post to Situation Display, Unpost from Situation Display, Rotate Up, Rotate Down, and Stack. These functions allow the workstation user to post/unpost overlays to the Situation Display and the workstation's Map Display and change the stacking order of posted overlays within the Automated BN TOC. Figure A-48 shows the flow to specific Stacking operations.

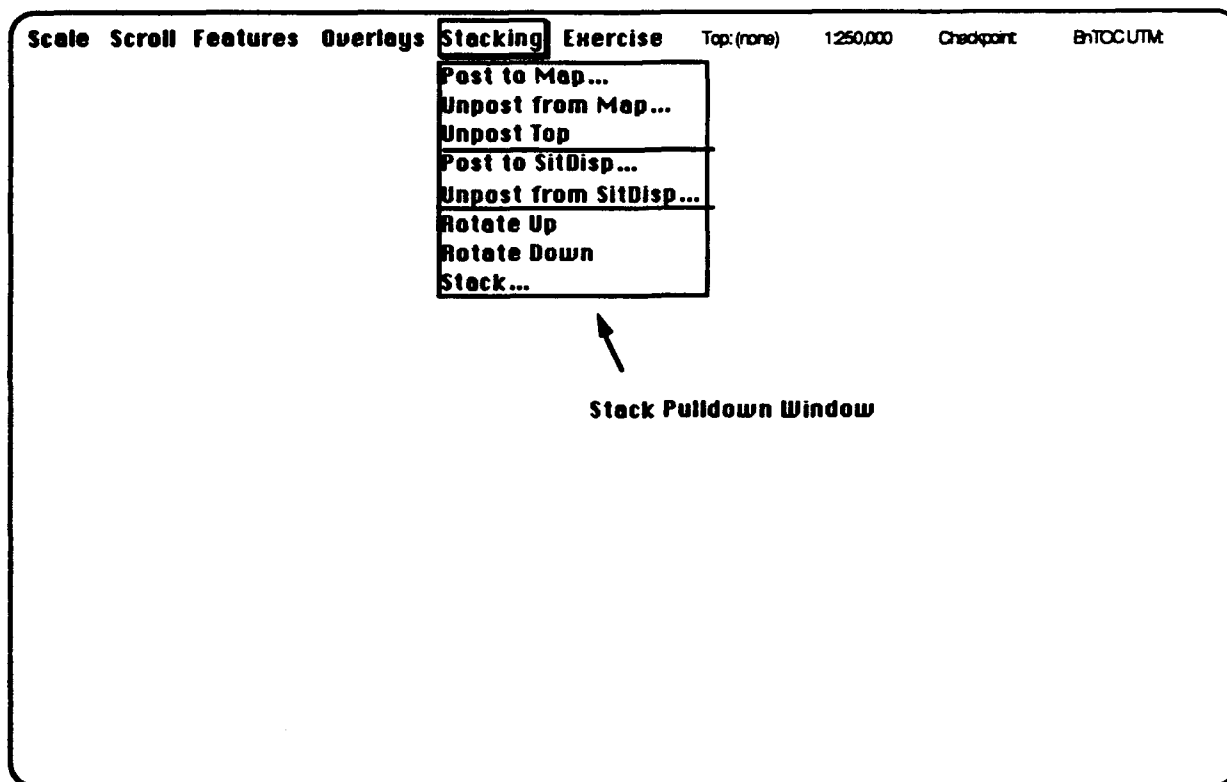


Figure 36. Stack Pulldown Window

Post to Map

The purpose of the Post to Map function is to give the workstation user the capability to post desired overlays to the Digital Map. An example of this function is the S3 posting the S2's enemy situation template overlay to his Map Display to evaluate the current Operations Overlay.

The user selects the Post to Map function from the Stack pulldown window shown in Figure 36. When Post to Map is selected, the Post to Map window (shown in Figure 37) is displayed. The Post to Map window displays a list of overlays available that have not been posted to the map and has three options that can be performed. The options available are: Close, Post, and selecting an overlay to post from the displayed list. The user must first select the desired overlay to be posted and then Post to Map. Then the selected overlay is posted to the Digital Map as the top overlay on the map. Figure A-49 shows the flow of operations associated with posting an overlay to the Digital Map.

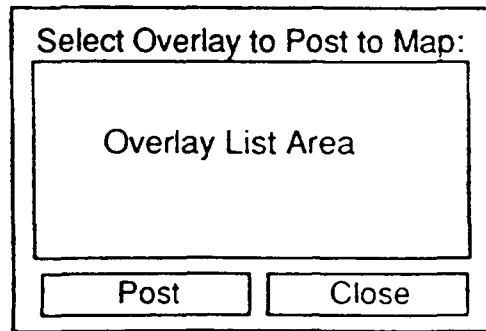


Figure 37. Post to Map Window

Unpost from Map

The purpose of the Unpost from Map function is to provide the workstation operator the capability to remove overlays from the Digital Map. The workstation operators would either use this function whenever posted overlays are no longer needed on the Map Display or to just unclutter the Map Display.

The operator selects the Unpost from Map function from the Stack pulldown window shown in Figure 36. When Unpost from Map is selected, the Unpost from Map window (shown in Figure 38) is displayed. The Unpost from Map window displays a list of overlays that are posted to the map and has three options that can be performed. The options available are Close, Unpost, and select an overlay to remove from the displayed list. Once the user selects the desired overlay to be removed and Remove, the selected overlay is removed from the Digital Map. Figure A-50 shows the flow of operations associated with unposting an overlay from the Digital Map.

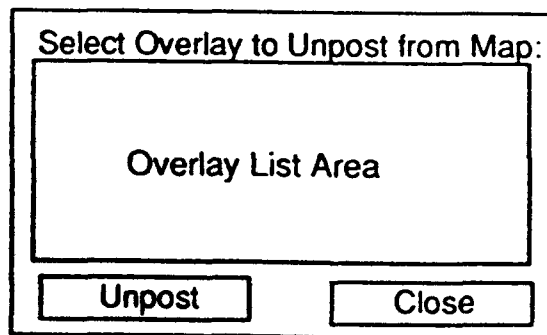


Figure 38. Unpost From Map Window

Unpost Top

The Unpost Top function provides the workstation user the capability to quickly remove the top overlay from the Digital Map. The S3 could use this function to remove an enemy situational template that he/she had posted to check the operations overlay.

The user selects the Unpost Top function from the Stack pulldown window shown in Figure 36. When Unpost Top is selected, the top posted overlay is removed from the Digital Map. Figure A-51 shows the flow of operations associated with unposting the top overlay from the Digital Map.

Post to SitDisp

The purpose of the Post to SitDisp function is to provide the workstation operator with the capability to post overlays to the Situation Display. The S3 would use this function to post the latest Operations Overlay to the Situation Display so that the Commander or Executive Officer can review the current situation.

The operator selects the Post to SitDisp function from the Stack pulldown window shown in Figure 36. When Post to SitDisp is selected, the Post to SitDisp window (shown in Figure 39) is displayed. The Post to SitDisp window displays a list of overlays that are not posted to the Situation Display and has three options that can be performed. The options available are: Close, Post, and selecting an overlay to post. Once the operator selects the desired overlay to be posted then selects Post, the selected overlay is posted to the Situation Display. Figure A-52 shows the flow of operations associated with posting an overlay to the Situation Display.

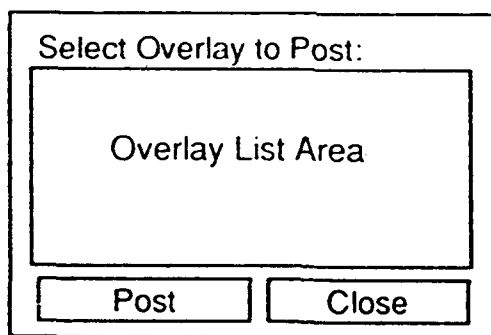


Figure 39. Post to SitDisp Window

Unpost from SitDisp

The purpose of the Unpost from SitDisp function is to provide the workstation user the capability to remove overlays that are posted to the Situation Display. Either the S2 or S2 could use this function to remove any overlays they had posted to the Situation Display.

The user selects the Unpost from SitDisp function from the Stack pulldown window shown in Figure 36. When Unpost from SitDisp is selected, the Unpost from SitDisp window (shown in Figure 40) is displayed. The Unpost from SitDisp window displays a list of overlays that are posted to the Situation Display by that workstation and has three options that can be performed. The

options available are: Close, Unpost, and selecting an overlay, from the displayed list to remove. Once the user selects the desired overlay to be removed then selects Unpost, the selected overlay is removed from the Situation Display. Figure A-53 shows the flow of operations associated with posting an overlay to the Situation Display.

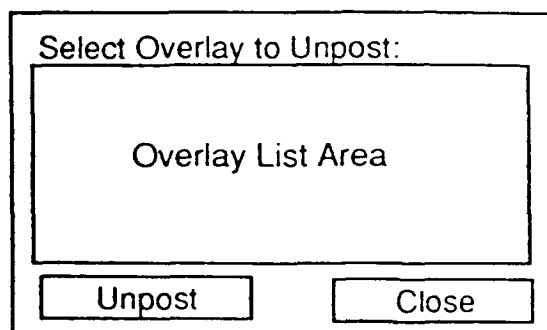


Figure 40. Unpost From SitDisp Window

Rotate Up

The purpose of the Rotate Up function is to allow the workstation operator to change the stacking order of posted overlays by moving the top overlay to the bottom of the overlay stack and moving the rest of the posted overlays up one position.

The operator selects the Rotate Up function from the Stack pulldown window shown in Figure 36. When Rotate Up is selected, the stacking order of overlays posted to the Digital Map is changed. The top overlay is moved to the bottom of the overlay stack, and the rest of the posted overlays are moved up one position. Figure A-54 shows the operations associated with using the Rotate Up function.

Rotate Down

The Rotate Down function provides the workstation user the capability to change the stacking order of posted overlays by moving the bottom overlay to the top of the overlay stack and moving the rest of the posted overlays down one position.

The user selects the Rotate Down function from the Stack pulldown window shown in Figure 36. When Rotate Down is selected, the stacking order of overlays posted to the Digital Map is changed. The bottom overlay is moved to the top of the overlay stack, and the rest of the posted overlays are moved down one position. Figure A-55 shows the operations associated with using the Rotate Down function.

Overlay Stack

The purpose of the Stack function is to give the workstation user the capability to selectively change the stacking order of posted overlays by individually moving overlays to either the top or bottom of the overlay stack.

The user selects the Stack function from the Stack pulldown window shown in Figure 36. When Stack is selected, the Overlay Stack window (shown in Figure 41) is displayed. The Overlay Stack window displays a list of overlays that are posted to the Digital Map and has four options that can be performed. The options available are: Close, To Top, To Bottom, and selecting an overlay from the displayed list. Once the user selects the desired overlay to be moved and either Top or Bottom, the selected overlay is either moved to the top or bottom of the overlay stack, respectively. Figure A-56 shows the flow of operations associated with using the Stack function to change the stacking order of posted overlays.

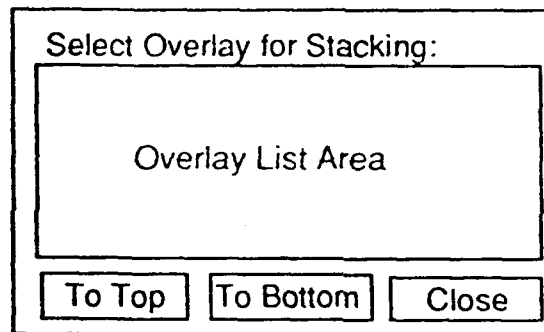


Figure 41. Overlay Stack Window

Exercise Operations

The purpose of the Exercise functions is to provide evaluators and testers the capability to control exercises, operations, and tests being conducted using the Automated BN TOC.

The Exercise functions are only available on the workstation that is brought up as a Coordinator workstation. A Coordinator workstation is used to control exercises, operations, and tests being conducted on the Automated BN TOC within CCTB. The Exercise functions are selected from the main menu bar shown in Figure 3 of the Map Screen. When a tester or evaluator selects Exercise, the Exercise pulldown window (shown in Figure 42) is displayed. The options available are: BN TOC UTM, Checkpoint, Shutdown, Restart, and Delete. These functions allow the Coordinator workstation to control and save the conditions of nodes on the CCTB. Figure A-57 shows the flow to specific Exercise operations.

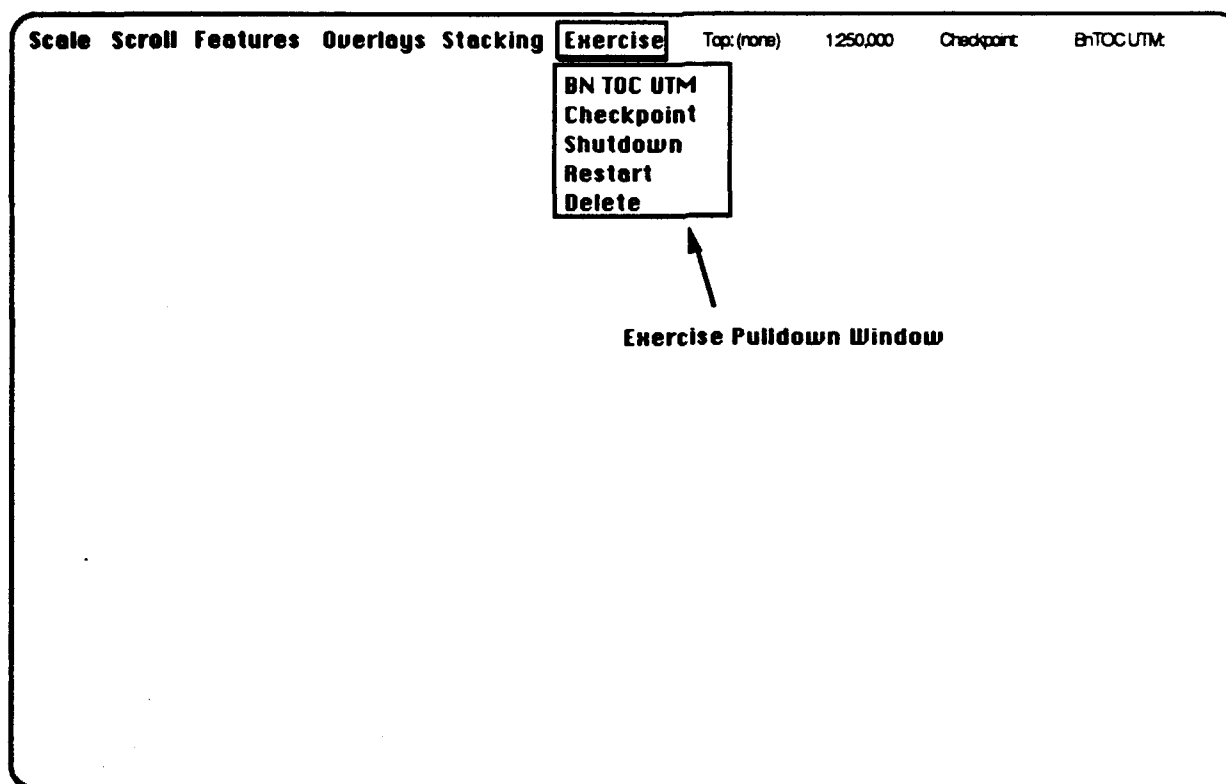


Figure 42. Exercise Pulldown Window

BN TOC UTM

The purpose of the BN TOC UTM function is to provide the coordinator workstation operator the capability to change the grid coordinate associated with the BN TOC. This allows the the other workstation operator to "Home" the Digital Map to a different location. The Home function is documented in the Scroll Operation section of this document.

The operator selects the BN TOC UTM function from the Exercise pulldown window shown in Figure 42. When BN TOC UTM is selected, the BN TOC UTM Grid window (shown in Figure 43) is displayed. The BN TOC UTM Grid window has three options that can be performed. The options available are: Cancel, pressing the "Enter" key, and entering a new grid coordinate location. The grid coordinate entered by the operator must have the two letter Grid Zone Designator and have an even number of grid coordinates up to a maximum of eight. Once the operator enters the desired UTM grid and presses "Enter", the new BN TOC UTM grid is entered into the BN TOC workstations. Figure A-58 shows the flow of operations associated with using the BN TOC UTM function.

Enter New BN TOC UTM Grid

ES675432

Cancel

Figure 43. BN TOC UTM Grid Window

Checkpoint

The purpose of the Checkpoint function is to provide the coordinator workstation operator the capability to save the state of all workstations and vehicle simulators on the same network as the Coordinator workstation. The Checkpoint file is used to restart workstations and vehicle simulators in a predetermined location and condition.

The operator selects the Checkpoint function from the Exercise pulldown window in Figure 42. When Checkpoint is selected, the Checkpoint window (shown in Figure 44) is displayed. The Checkpoint window has three options that can be performed. The options available are: Close, Checkpoint, and typing in a checkpoint name. Once the operator enters the desired name and selects Checkpoint, the current status of all workstations, simulators, and anything else on the network is saved. Figures A-59 and A-60 show the flow of operations associated with checkpointing.

Enter Checkpoint Name

New Checkpoint Name

Checkpoint Cancel

Figure 44. Checkpoint Window

Restart

The purpose of the Restart function is to provide the coordinator workstation operator with the capability to restart all workstations and simulators on the CCTB network from a previously saved Checkpoint file. This function can be used to run multiple TOC crews through the same scenario and compare the performance between TOC staffs.

The operator selects the Restart function from the Exercise pulldown window shown in Figure 42. When Restart is selected, the Restart window (shown in Figure 45) is displayed. The Restart window displays a list of all Checkpoint files and has three options that can be performed. The options available are: Close, Restart, and selecting a Checkpoint file. Once the operator selects the desired Checkpoint file then selects Restart, a message is displayed requesting confirmation from the operator to restart all workstations and vehicle simulators. Once an affirmative response is received, all workstations and simulators are restarted under the selected Checkpoint file. Figure A-61 shows the flow of operations associated with restarting the workstations and vehicle simulators.

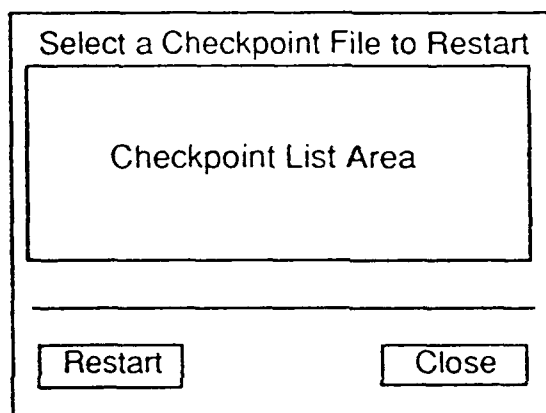


Figure 45. Restart Window

Exercise Delete

The purpose of the Delete function is to provide the coordinator workstation operator the capability to delete Checkpoint files that are no longer needed.

The operator selects the Delete function from the Exercise pulldown window shown in Figure 42. When Delete is selected, the Delete Exercise window (shown in Figure 46) appears. The Delete Exercise window displays a list of available Checkpoint files and has three options that can be performed. The three options are: Close, Delete, and selecting a Checkpoint file from the list. Once the operator selects the desired Checkpoint file then selects Delete, a message is displayed requesting confirmation from the operator to delete the selected Checkpoint file. Once an affirmative response is received, the Checkpoint file name is removed from the displayed list and the file is deleted. Figure A-62 shows the flow of operations associated with deleting a Checkpoint file from the system.

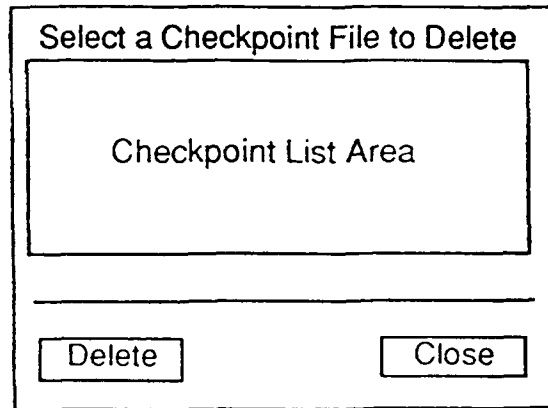


Figure 46. Delete Exercise Window

Displayed Icons

Selecting a displayed icon is the remaining function that can be performed at the Map Screen level on the Map Display. The purpose of selecting displayed icons is to provide the workstation user the capability either to gain more information about icons displayed on the Digital Map or to change the icons so that information can be added or removed from the Digital Map. An example of this might be the S2 selecting a report generated icon on his/her map display to determine what report caused this icon to be displayed. The S3 could select a POSNAV displayed icon to change the icon aggregation level so that he/she can unclutter the map display.

The user can select displayed icons at any time on the Map Display except when the drag is turned on. Then selecting an icon causes nothing to happen. There are three different types of icons that can be displayed. They are: POSNAV/Graphic icons, report generated icons, and pointing arrow-heads on the side of the Digital Map.

If the user selects a POSNAV icon, a pulldown window (shown in Figure 47) is displayed with the following options: Aggregate, Bring to Front, and Send to Back. Moving the cursor to Aggregate causes a cascading window to appear with the following options: Battalion, Company, Platoon, and Vehicle. Selecting one of these levels causes the selected icon to be aggregated to the selected level. If the user selects Bring to Front or Send to Back, the level at which the icon is displayed on the Digital Map changes. This means the icon will be shown on the display either in front of or behind any other graphic on the display, with the exception of the map.

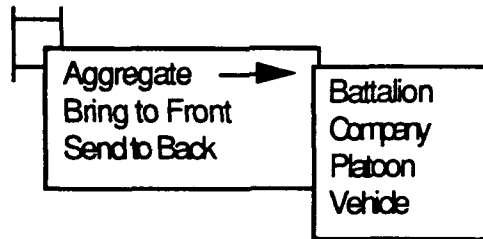


Figure 47. POSNAV Icon Pulldown Window

If the user selects a report generated icon, the pulldown window (shown in Figure 48) is displayed with the following options: Link To, View, Delete, Bring to Front, and Send to Back. The Link To function is used to link report icons to either POSNAV or graphic control icons. The View function causes the report associated with that icon to appear on the Map Screen. The Delete function removes the displayed icon from the Digital Map. Selecting Bring to Front or Send to Back performs as stated above in selecting a POSNAV icon.

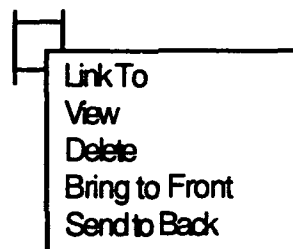


Figure 48. Report Icon Pulldown Window

The user can select a pointing arrow with either the left or center mouse button. Depending on what the arrow-head is pointing at, if the user presses the center mouse button, either the pulldown menu for the POSNAV icon or the menu for the report generated icon is displayed. If the left mouse button is pressed, a pulldown window (shown in Figure 49) is displayed with the following options: Go To and Remove Arrow. Selecting Go To causes the Digital Map to reposition so that the icon being pointed to is in the center of the Map Display. Selecting Remove Arrow removes the pointing arrow-head from the Map Display.

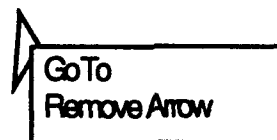


Figure 49. Arrowhead Icon Pulldown Window

Figures A-63 through A-68 show the flow of operations associated with selecting a displayed icon.

Build and Edit Overlays Screen

The following section details the set of functions available on the Map Display to create and edit overlays. This set of functions is only available when the workstation operator edits or creates an overlay. The purpose of the Build and Edit Overlays Screen is to provide the operator the capability to create and edit overlays. The operator uses this function to build any overlay, whether it is an Operations Overlay or an Enemy Situational Template.

The operator can enter the Build and Edit Overlays Screen (shown in Figure 50) either through the Create or Edit functions from the Overlay pulldown window on the main menu of the Map Screen. These functions are documented in the Create Overlay and Edit Overlay section, respectively. When the Build and Edit Overlays Screen appears, the main menu on the Map Screen changes. The Stacking function is removed and Group is added in its place on the main menu bar. The specific options available are: selecting Overlays, drawing a control measure, posting a symbol, editing an existing symbol or drawn control measure, selecting Group, selecting a displayed icon (see Displayed Icon section), and using the scroll bars or dragging the map (see Scroll Operations section). Figure A-69 shows the flow to specific operations on the Build and Edit Overlays Screen.

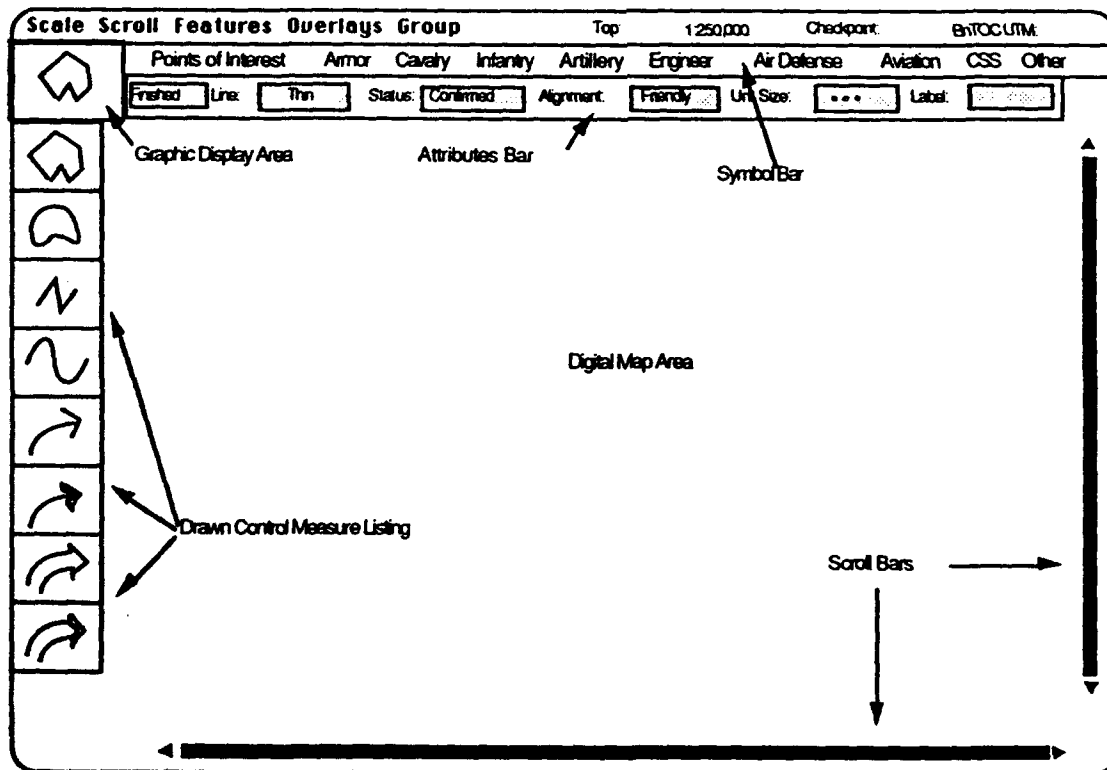


Figure 50. Build and Edit Overlays Screen

Select Overlays

Selecting Overlays from the main menu bar allows the workstation user to save or clear overlays and exit the Build and Edit Overlays Screen. These functions could be used by the user after he/she is finished editing an overlay and needs to save the overlay and exit the Build and Edit Overlays Screen.

The user selects overlays from the main menu bar of the Build and Edit Overlays Screen shown in Figure 50. When it is selected, the Select Overlays pulldown window (shown in Figure 51) appears. The options available on this window are: Save, Save As, Done Editing, and Clear All. These functions allow the workstation user to save or clear overlays and exit the Build and Edit Overlays Screen.

When the user selects Save, the current overlay displayed on the Build and Edit Overlays Screen is saved. The Save As function allows the current overlay to be saved under a new name. The Done Editing option is used to exit the Build and Edit Overlays Screen and bring the Map Screen back to the Map Display. The Clear All function clears all drawn graphics from the current overlay on the Build and Edit Overlays Screen. Figures A-70 through A-74 show the flow of the specific Overlay operations.

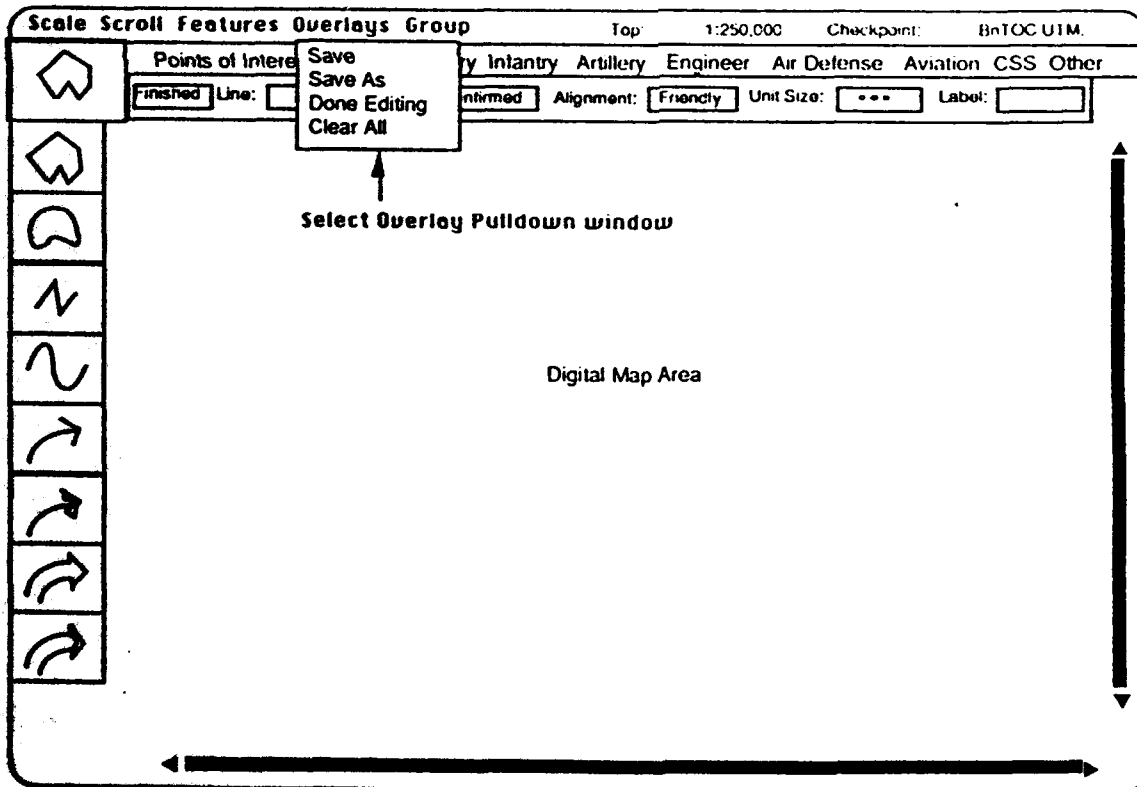


Figure 51. Select Overlay Pulldown Window

Draw Control Measure

A control measure is defined in FM 101-5-1, "Operational Terms and Symbols", as "directives given graphically or orally by a commander to subordinate commands in order to assign responsibilities, coordinate fires and maneuver, and to control combat operations." The purpose of the Draw Control Measure function is to provide the workstation user the ability to draw graphic control measures on overlays so that the directives required to control combat operations can be sent to subordinate elements of the TOC.

The user selects the Drawn Control Measures options from the left side of the Build and Edit Overlays Screen shown in Figure 50. The workstation has a choice of seven different types of control measures that can be drawn. These options are: Angled Shapes, Curved Shapes, Angled Lines, Curved Lines, Curved Arrows, Curved Double Headed Arrows, Curved Double Stemmed Arrows, and Curved Double Headed and Double Stemmed Arrows.

Once the user selects a drawn control measure type, the Edit Attributes Screen is displayed in the Build and Edit Overlays Screen. That control measure's attributes can now be edited. Editing control measure attributes is documented in the Edit Attributes Screen section. When the control measure's attributes are correct, the user can draw it on the overlay. The workstation operator draws the measure by moving the mouse and pressing the left and center mouse buttons. When the user presses the left button, a drawing point is placed on the screen. This point will be used to shape the control measure. Pressing the center mouse button determines the last point of the control measure. Once the center mouse button is pressed, the control measure is drawn according to its attributes onto the overlay. Figures A-75 through A-77 show the flow of operations associated with drawing a control measure on an overlay.

Edit Attributes Screen

The purpose of the Edit Attributes Screen is to provide the workstation operator with the capability to edit the attributes of drawn control measures and posted graphics.

The operator accesses the Edit Attributes Screen through the Build and Edit Overlays Screen either when a graphic control measure is being drawn, a symbol is being posted, or an existing graphic (either drawn or symbol) is being edited. A graphic's attributes are edited from the attribute bar shown in Figure 50. Table 1 shows a listing of attributes for each drawn control measure. When a graphic is selected, it appears in the Graphic Display field (shown in Figure 50). The Graphic Display field shows the workstation user a preview of the graphic before it is drawn on the Digital Map. As the graphic's attributes are edited, then the graphic control measure in the Graphic Display field

changes. Once the operator finishes drawing a graphic or selects Finished from the Attributes bar, the Edit Attributes Screen disappears. Figures A-78 through A-81 show the flow of operations associated with editing a graphic control measure's attributes.

Table 1

Drawn Control Measure Attribute Listing

	Line	Status	Alignment	Unit Size	Label	Head	Tail
Angled Shapes	X	X	X	X	X		
Rounded Shapes	X	X	X	X	X		
Angled Lines	X	X	X	X	X		
Curved Lines	X	X	X	X	X		
Curved Arrows	X	X	X		X	X	
Curved Double Headed Arrows	X	X	X		X	X	
Curved Double Stemmed Arrows	X	X	X		X	X	X
Curved Double Headed & Stemmed Arrows	X	X	X		X	X	X

Post Symbol

The purpose of posting symbols is to allow the workstation operator the capability to make custom detailed overlays for operational use. The user could post symbols to identify specific units or symbolic control measures to an overlay.

The military symbols the user can post to the digital map are selected from the top of the Build and Edit Overlays Screen shown in Figure 50. The workstation has ten categories from which the user can select symbols. The categories are: Points of Interest, Armor, Cavalry, Infantry, Artillery, Engineer, Air Defense, Aviation, CSS, and Other. Table 2 shows the symbols available by category with their associated attributes.

Once the user selects a symbol, the Edit Attributes Screen, with that symbol's attributes, is displayed in the Build and Edit Overlays Screen. When the symbol's attributes are correct, the user can post the symbol to the overlay. The user posts the

symbol by moving the cursor with the mouse and pressing the left or center button. When a mouse button is selected, the symbol is posted to the overlay. Figure A-82 and A-83 show the flow of operations associated with posting a control measure to an overlay.

Table 2

Symbol Type and Attribute Listing

	Status	Align	Unit Size	Left	Bottom	Right	Center	Text
Points of Interest: Checkpoint, Unlup Point, Passage Point, and ACP	X	X					X	
Points of Interest: Startpoint, Release Point, Coordinating Point, Contact Point, Point of Departure, and Traffic Control Point	X	X						
Armor: Armor, Arm Car, and Arm Abn	X	X	X	X	X	X		
Armor: Armor Bn TOC	X	X		X	X	X		
Cavalry: Arm Car, Air Car, Cavalry	X	X	X	X	X	X		
Cavalry: Cav Sqd TOC	X	X		X	X	X		
Infantry: Infantry, Mech Inf, Mez Inf, Li Inf, Ranger, BIFV (Aid), and Airborne	X	X	X	X	X	X		
Infantry: Inf TOC and Mech TOC	X	X		X	X	X		
Artillery: Artillery, Rocket Artillery, Surface, and Target Acqn	X	X	X	X	X	X		
Artillery: 155 How SP and 203 How SP	X	X	X	X		X		
Engineer: Engineer, Bldg, Topo Eng, Amphib Eng, and Sway	X	X	X	X	X	X		
Air Defense: Air Defense, Surf Air, and Surf Air Sp	X	X	X	X	X	X		
Aviation: Helicopter and Fixed Wing	X	X	X	X	X	X		
CSS: Armor Train, Mech Train, and ALOC	X	X	X	X	X	X		
CSS: Ammo Bn Pt	X	X						
Other: Signt, Medcat, MI Police, and CEWM	X	X	X	X	X	X		
Other: Text								X

Edit Graphic

The Edit Graphic functions provide the workstation user the capability to move, adjust, and change the graphics of an overlay. An example of this is the S3 developing an operations overlay. He/she can post the graphic initially, and then either adjust it's location or change its attributes.

An overlay with posted graphics must be on the Build and Edit Overlays Screen in order for the user to edit existing graphics. There are three types graphics that the user can edit: Symbols, Drawn Graphical Control Measures, and Text Labels.

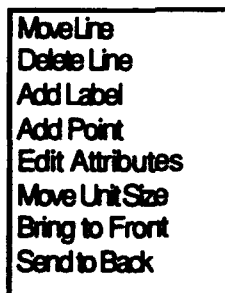
For symbols, the user moves the cursor to the desired symbol. Both the left and center mouse buttons can be used to edit the symbol. The center button moves and repositions the symbol. If the left button is pressed, the pulldown window (shown in Figure 54) appears with the following options: Move Object, Delete Object, Link To, Unlink, Hierarchy, View, Edit Attributes, Bring to Front, and Send to Back. Move Object allows the symbol to be moved and placed in another location. Selecting Delete Object removes the selected symbol from the overlay. Selecting Link To links the posted symbol to another posted symbol. The Unlink function unlinks any symbols that are linked to it. Hierarchy allows linked icons to be aggregated at the battalion, company, and platoon levels. The View function allows the workstation user to view any messages linked to the posted symbol. Selecting Edit Attributes brings up the Edit Attributes Screen with that symbol's attributes in the associated fields. The Bring to Front and Send to Back functions perform as previously stated.



Figure 52. Symbol Edit Pulldown Window

For drawn control measures, the user moves the cursor to a drawing point of that symbol. The user uses both the left and center mouse buttons to edit the control measure. The center button moves and repositions the drawing point. The control measure is reshaped when the button is released. If the left button is pressed, the pulldown window (shown in Figure 55) appears with the following options: Move Line, Delete Line, Add Label, Add Point, Move Point, Delete Point, Edit Attributes, Move Unit Size, Bring to Front, and Send to Back. The Move Line

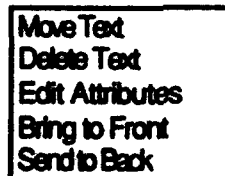
function causes the selected control measure to retain it's original shape but be moved to a different location on the overlay. Selecting Delete Line removes the selected line from the overlay. Selecting Add Label posts another label as defined by that control measure's attributes to the drawing point selected. Selecting Add Point adds another point to the control measure to help the workstation user reshape the control measure. The Move Point function allows the workstation operator to move existing drawing points to reshape the drawn control measure. Selecting Edit Attributes brings up the Edit Attributes Screen with that control measure's attributes in the associated fields. Selecting Move Unit Size moves the unit size as defined by the control measure's attributes to the drawing point selected. The Bring to Front and Send to Back functions perform as previously stated.



MoveLine
Delete Line
Add Label
Add Point
Edit Attributes
Move Unit Size
Bring to Front
Send to Back

Figure 53. Drawn Control Measure Edit Pulldown Window

For text labels, the user must move the cursor to the desired text label on the overlay. The user can use both the left and center mouse buttons to edit the text label. The center button is used to move and reposition the text label. If the left button is pressed with the cursor on the label, the pulldown window (shown in Figure 56) appears with the following options: Move Text, Delete Text, Edit Attributes, Bring to Front, and Send to Back. The Move Text function allows operator the to move the selected text label to another location. Selecting Delete Text removes the selected text label from the overlay. Selecting Edit Attributes brings up the Edit Attributes Screen with that text label's attributes in the associated fields. The Bring to Front and Send to Back functions perform as previously stated.



Move Text
Delete Text
Edit Attributes
Bring to Front
Send to Back

Figure 54. Text Label Edit Pulldown Window

Figures A-84 through A-96 show the flow of operations associated with editing an existing graphic on an overlay.

Group

The purpose of the Group function is to provide the workstation user the capability to move, delete, and copy single or multiple graphic control measures and symbols. The S2 would use these functions to copy and post multiple symbols (such as enemy units) to develop an enemy doctrinal template.

The user selects the Group function from the main menu of the Build and Edit Overlays Screen shown in Figure 50. When Group is selected, the Group pulldown window (shown in Figure 57) appears. The options available are: Move, Delete, Duplicate, and selecting control measures on to which to perform Group functions. The user selects control measures either by dragging a box around the desired control measure or holding down the shift key and selecting the selected control measures with the mouse. Once a control measure is selected, then a Group function can be performed on it. Selecting Move allows the control measure(s) to be moved to a different location. The Delete option removes the selected control measure(s) from the overlay after a confirmation is received from the user. The Duplicate function causes the selected control measure(s) to be copied and posted onto the screen. Figure A-97 and A-98 shows the flow of operations associated with the Group function.

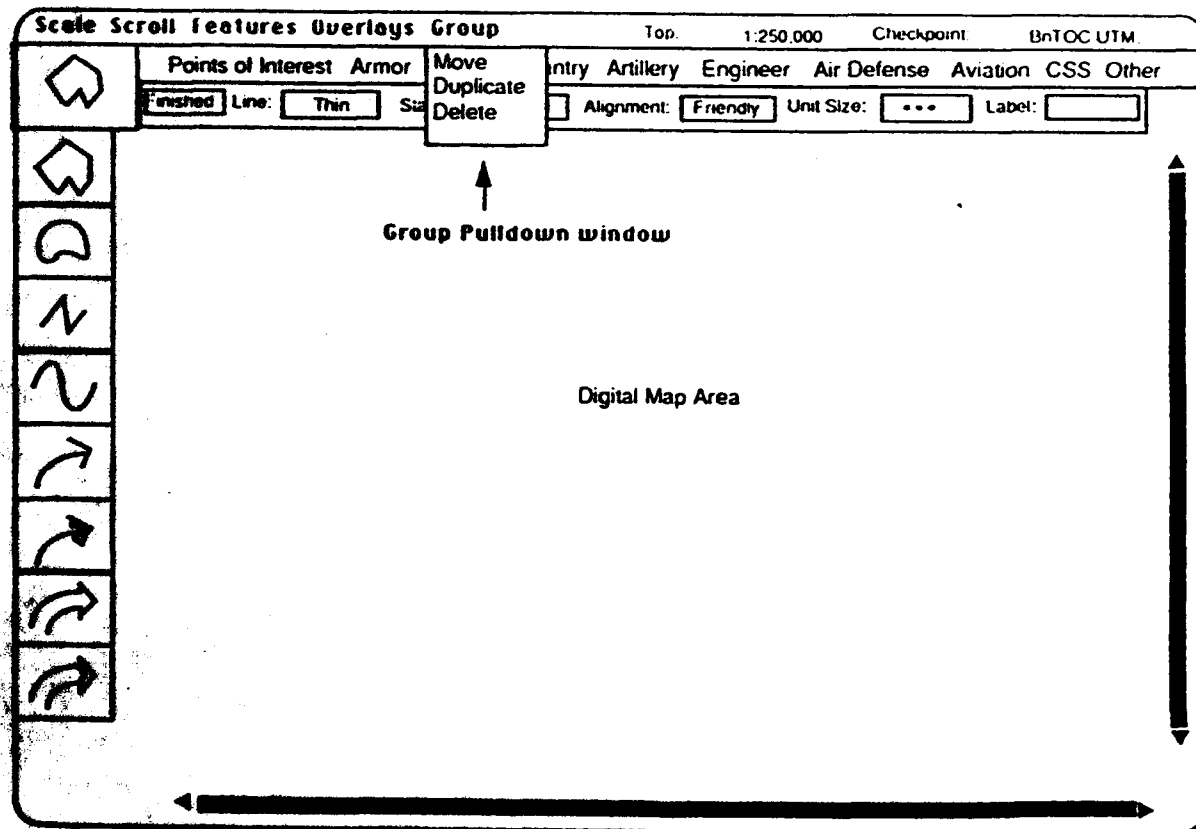


Figure 55. Group Pulldown Window

Summary

As shown in the previous sections, the existing TOC workstations are very complex and flexible. This prototype system has taken many of the tasks previously performed manually and, using new technology, automated those tasks. The new automation provides new capabilities and power that previously has not existed.

This report has documented both the physical and functional aspects of the automated BN TOC workstations. It has also provided descriptions of how the automated BN TOC interacts with other CVCC systems to include tank simulators and other TOC workstations. As stated previously, the CVCC program, under which the automated BN TOC is developed, is used to formulate future weapon systems and organizations. This prototype TOC, in an interactive environment such as the CCTB, is one such system that can be used to study the impact of increased automation on C³.

References

- Department of the Army (1988). Map Reading. FM 21-26.
- Department of the Army (1984). Staff Organizations and Operations. FM 101-5.
- Department of the Army (1985). Operational Terms and Symbols. FM 101-5-1.
- Heiden, C.K. (1989). The S-2 (Intelligence) Tactical Operations Center Workstation (Draft Specification). Unpublished Specification.
- Heiden, C.K. (1989). The S-3 (Operations) Tactical Operations Center Workstation (Draft Specification). Unpublished Specification.
- LaVine, N.D. (1991). Documentation and Lessons Learned for the Combat Vehicle Command and Control System (CVCC) in the Close Combat Test Bed's Tank Simulator. Unpublished.
- Smith, P. (1991). SIMNET CVCC Battalion TOC Workstation User Manual Release 1.5. BBN Report 7629. (available at the Close Combat Test Bed (CCTB) in Ft. Knox, Kentucky).

Appendix A

Functionality Flowcharts for the Automated Battalion TOC

Flow Chart Description

The following section consists of the flowcharts that describe the actions of the BN TOC. The flowcharts follow in figure number order and the order in which they are referenced within the body of the main document.

After the figure number and title of each of the flowcharts, there is a flowchart code that is used within the flowcharts to direct the reader to the other flowcharts in this appendix. The code consists of a FC# prefix (which means "Flowchart Number") and a two, three or four letter designator followed by a number. The letter designators determine to which series the flowcharts belong. For example, all flowcharts dealing with the Message Folder have a MF designator. The number following the letter designator determines the location and order of the flow chart series.

There are four shapes used in the flowcharts. The first shape is a rectangle. The rectangle is used as the start point for all flow charts, and also shows any system actions or changes that occur. The second shape is a rectangle with rounded corners. This shape is used to depict any actions that the workstation user performs within the system. The third shape is a diamond. This shape is used for making logical decisions within the system. The last shape is shaped like the home plate on a baseball diamond. This figure is used to direct the flow to different flowcharts on another page.

When "Make Alternate Selection" is shown, it means that any other selection, available from the selections available on that screen, can be selected. For example, on the first Message Folder flow chart, alternate selections would be found on the Infolder/Folder flow chart, which is the higher or parent flowchart for the Message Folder flowcharts.

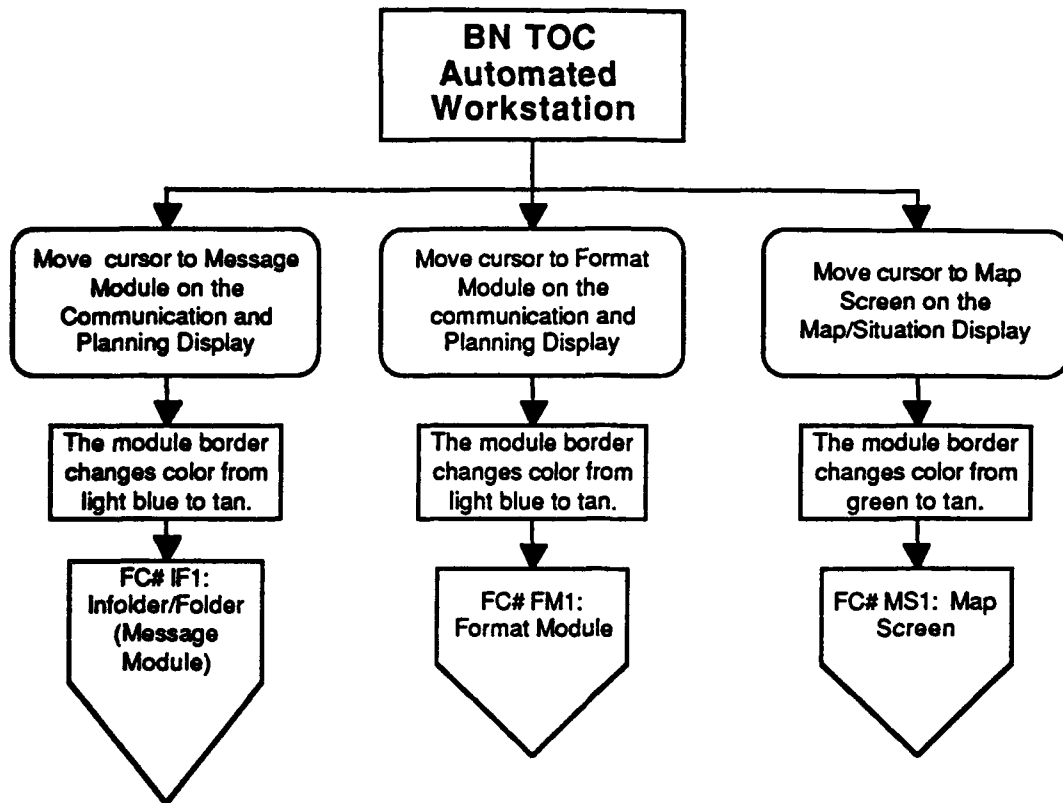
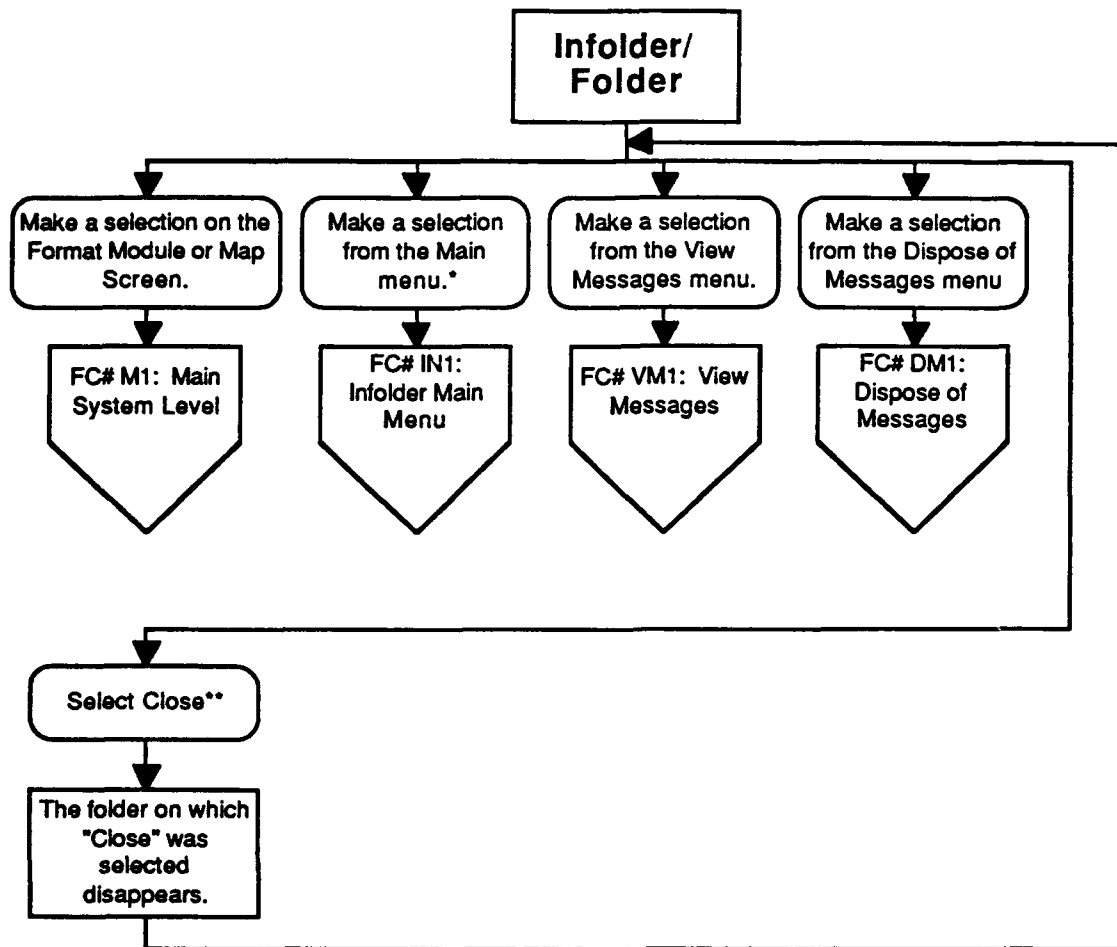


Figure A-1. Main System Level (FC# M1)



*The main menu is only available on the Infolder.

**All folders except the Infolder can be closed.
The Infolder does not have this function.

Figure A-2. Infolder/Folder (FC# IF1)

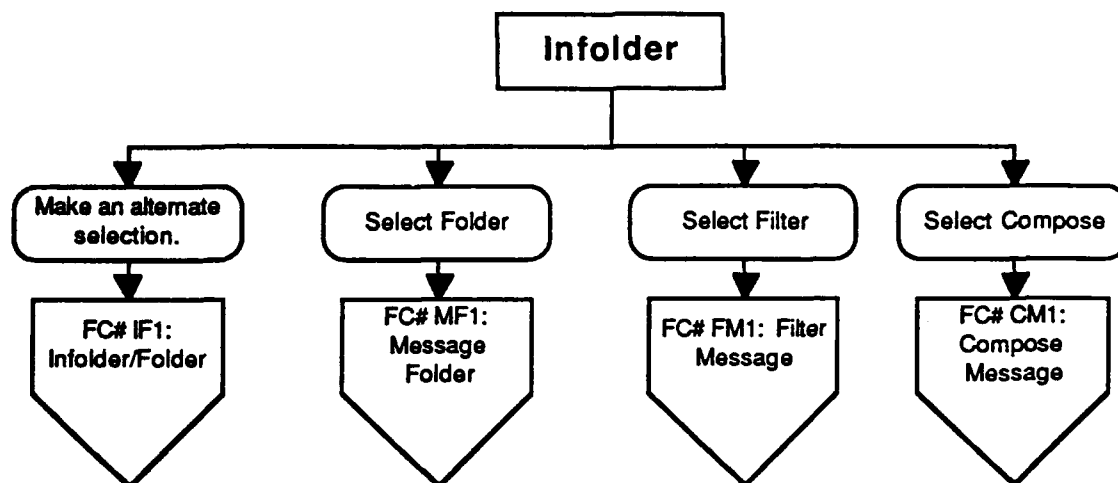


Figure A-3. Infolder Main Menu (FC# IN1)

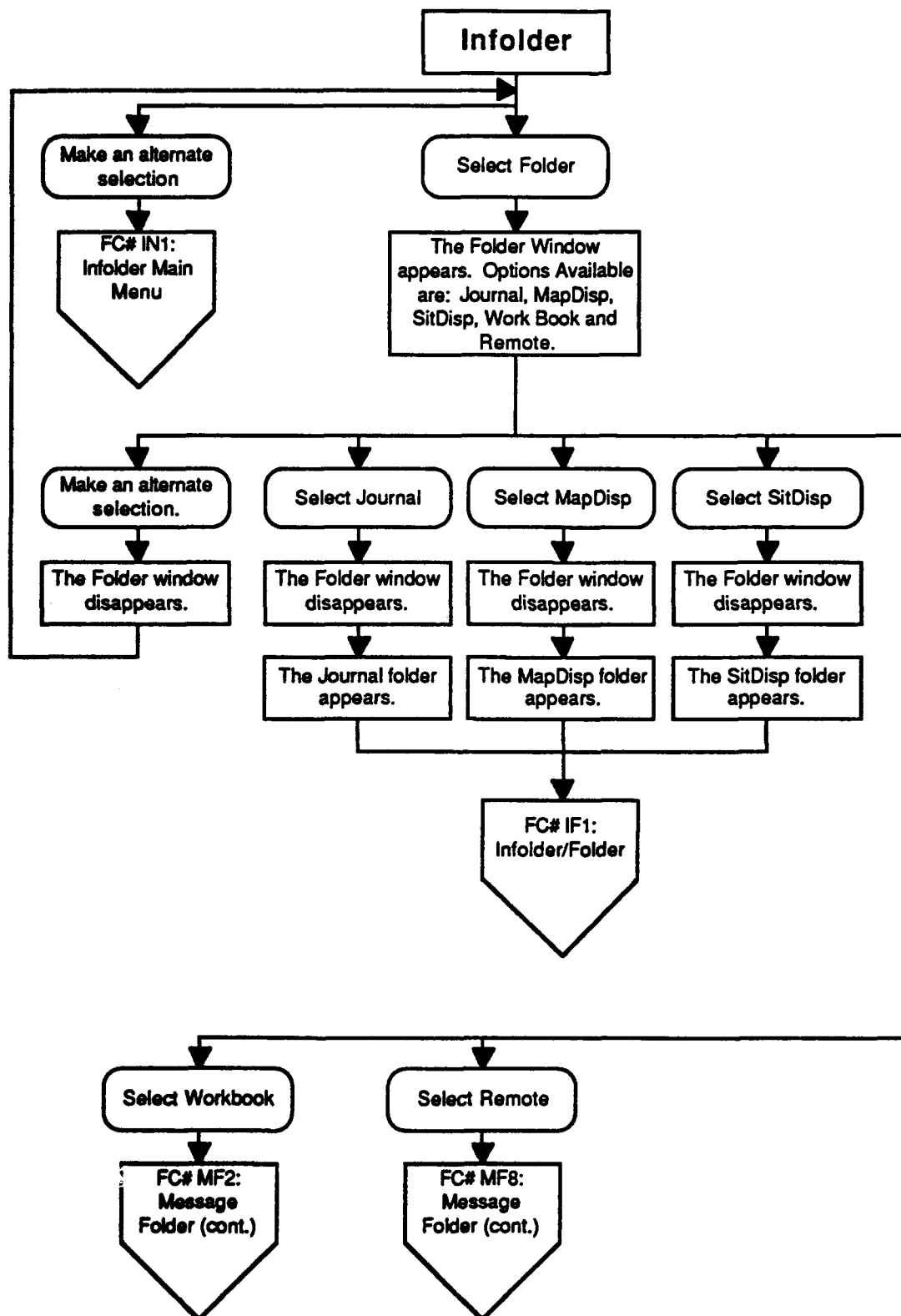


Figure A-4. Message Folder (FC# MF1)

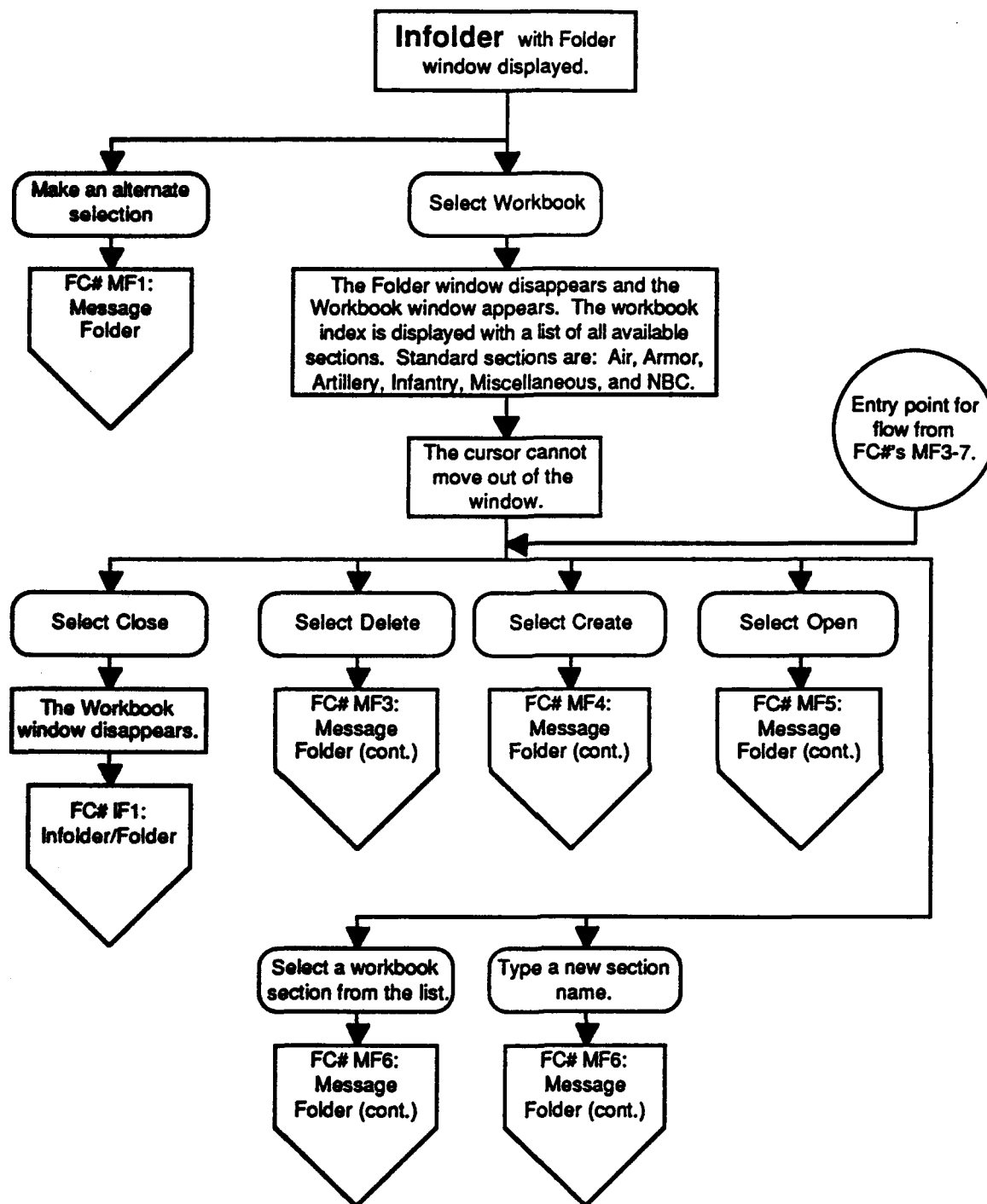


Figure A-5. Message Folder (cont.) (FC# MF2)

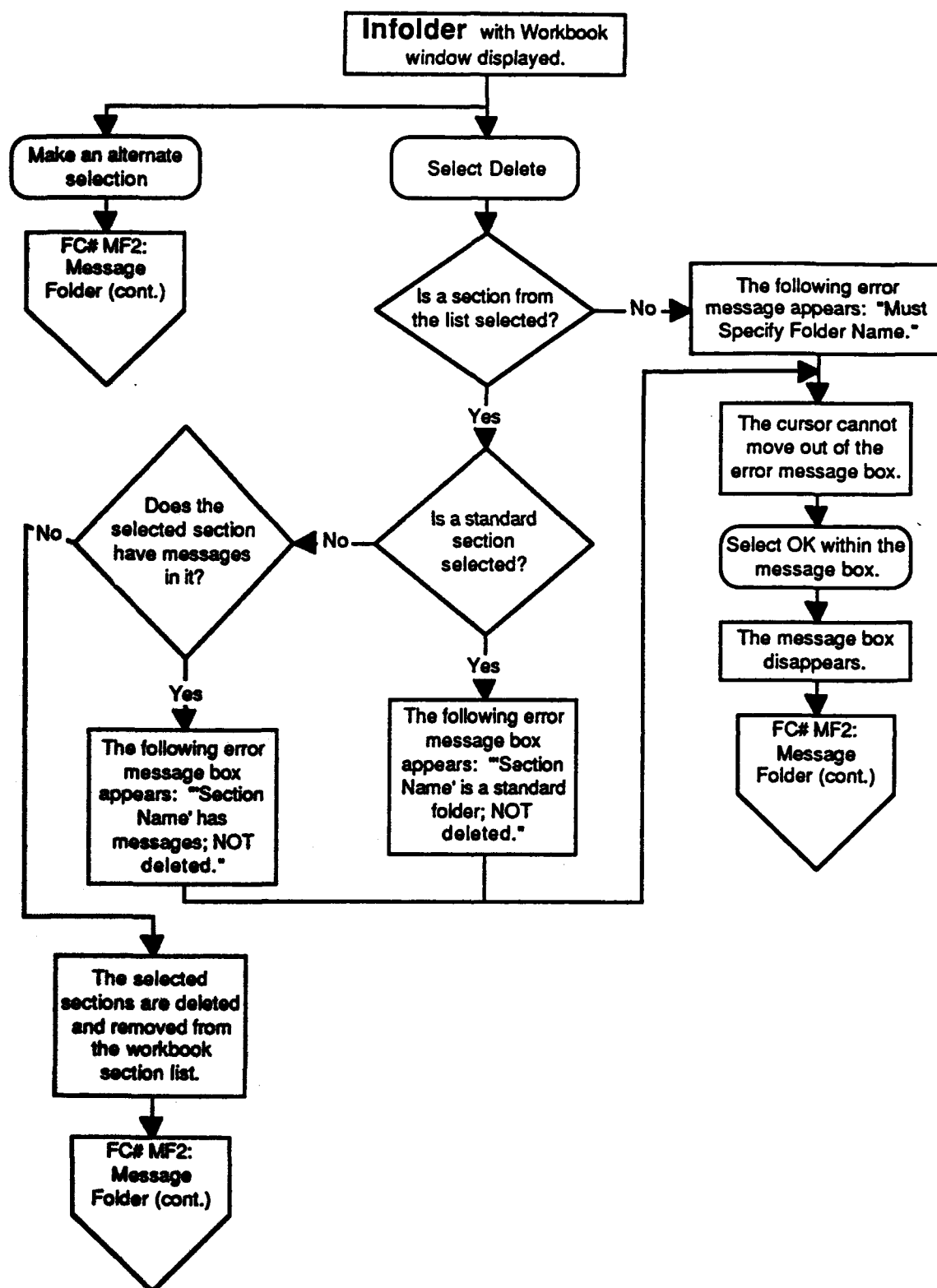


Figure A-6. Message Folder (cont.) (FC# MF3)

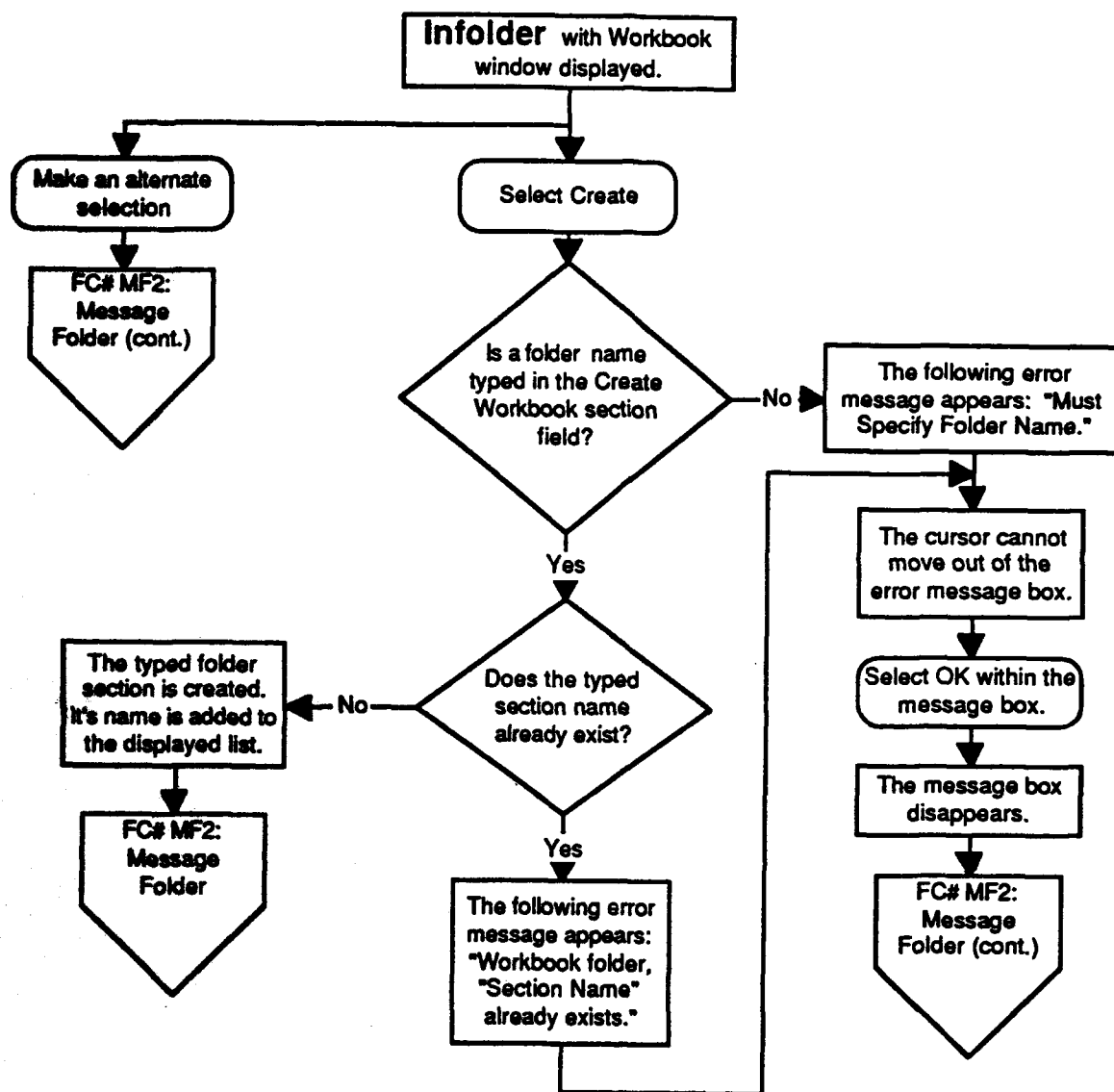


Figure A-7. Message Folder (cont.) (FC# MF4)

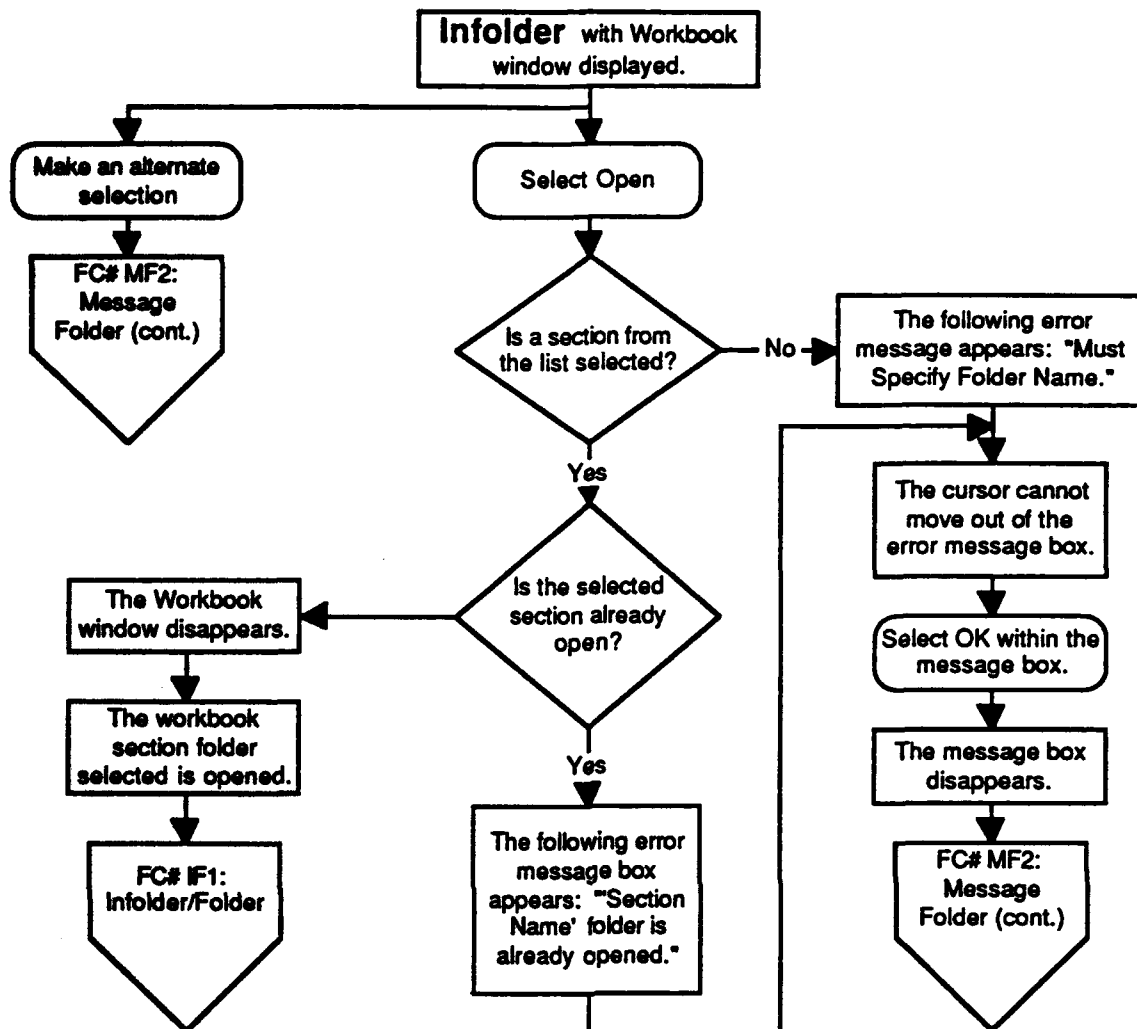


Figure A-8. Message Folder (cont.) (FC# MF5)

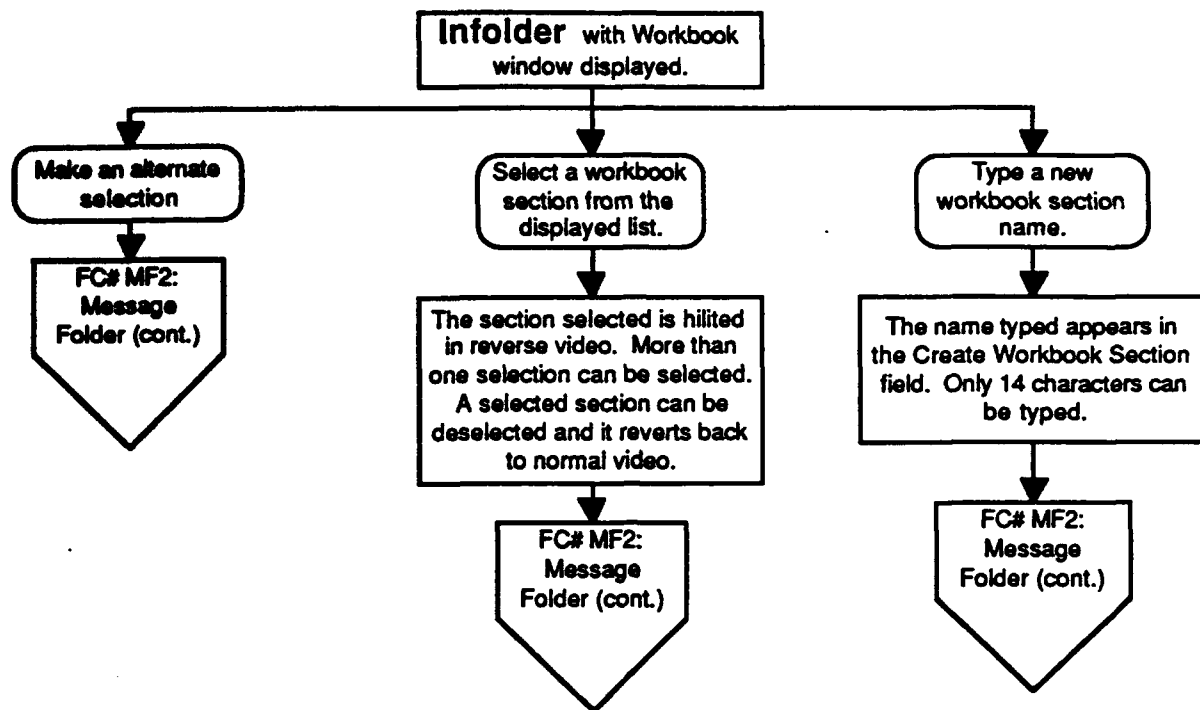


Figure A-9. Message Folder (cont.) (FC# MF6)

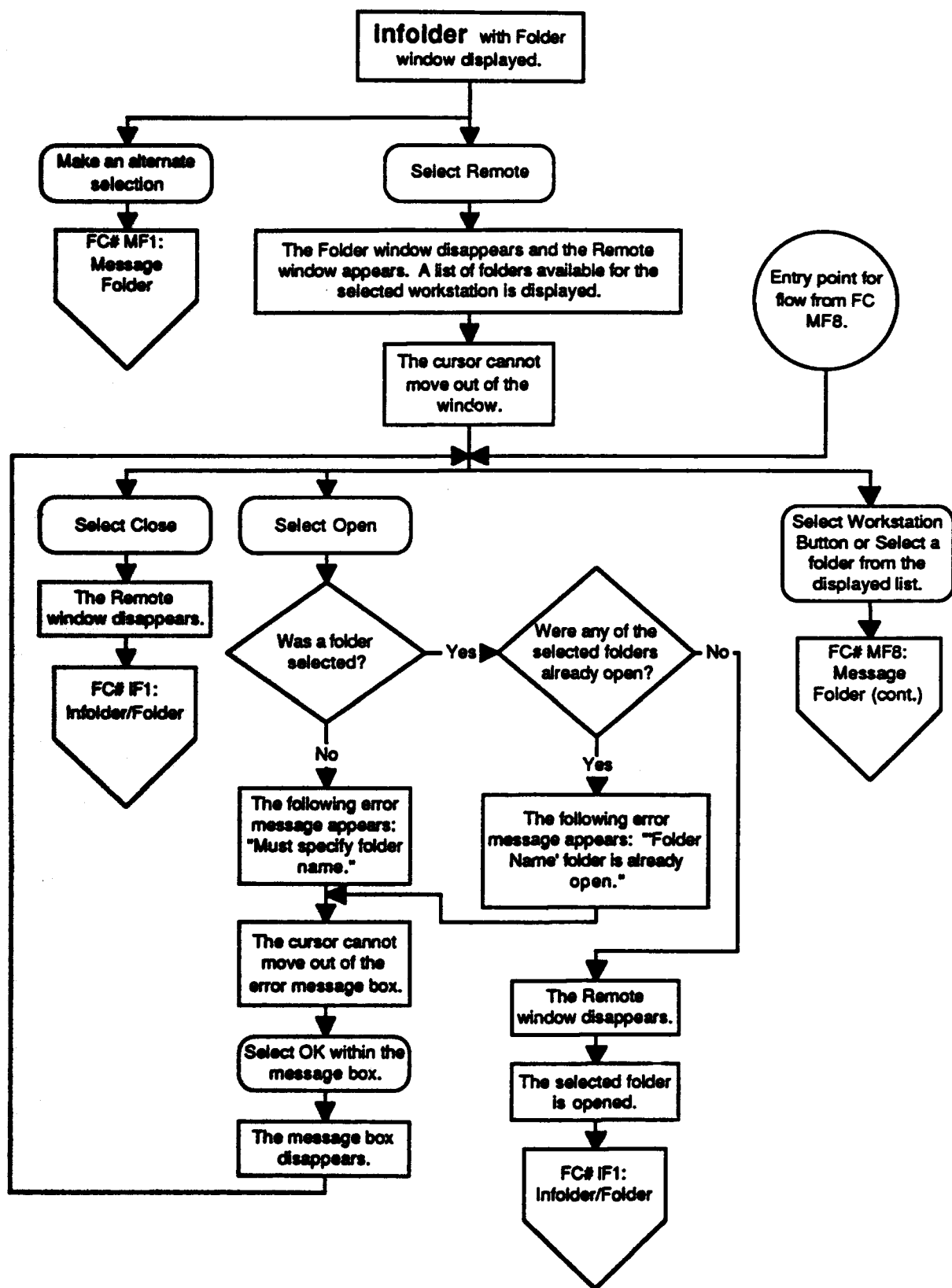


Figure A-10. Message Folder (cont.) (FC# MF7)

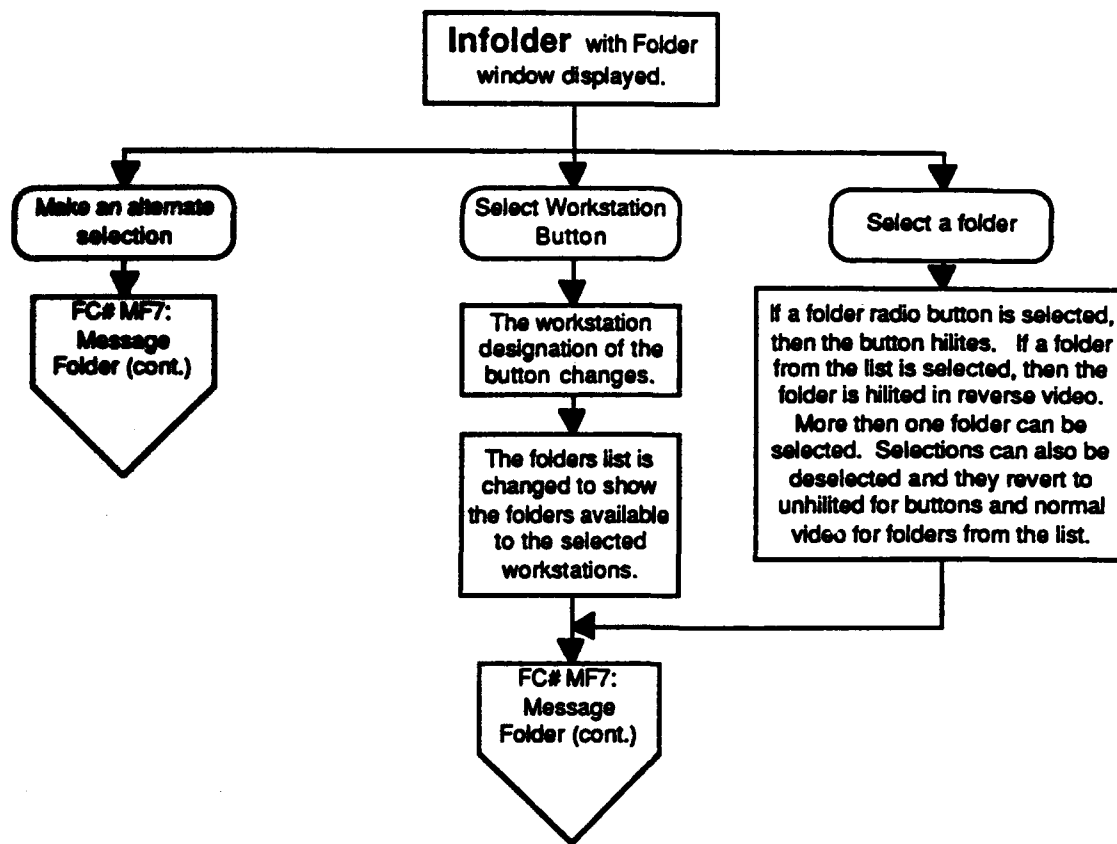


Figure A-11. Message Folder (cont.) (FC# MF8)

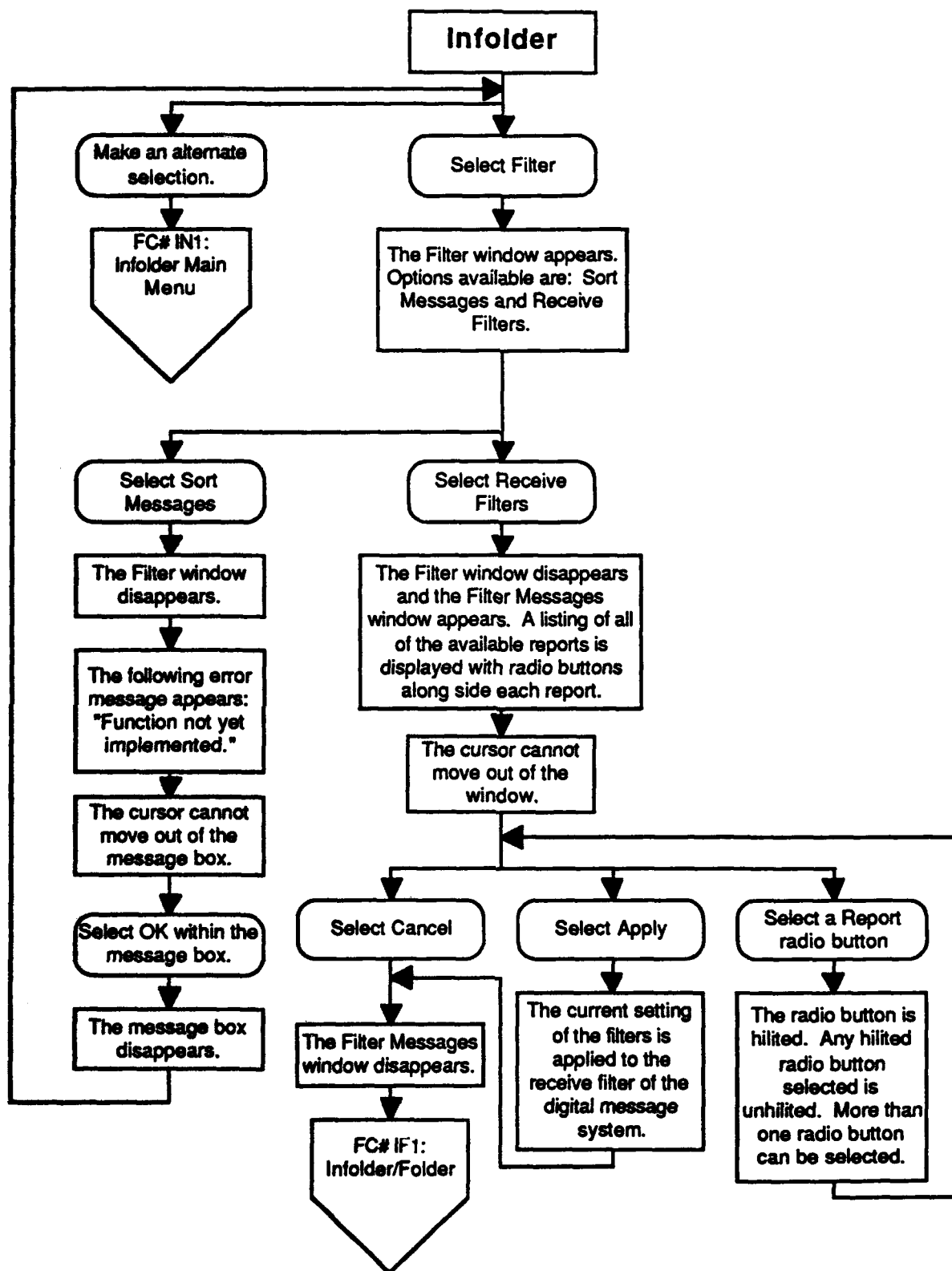


Figure A-12. Filter Message (FC# FM1)

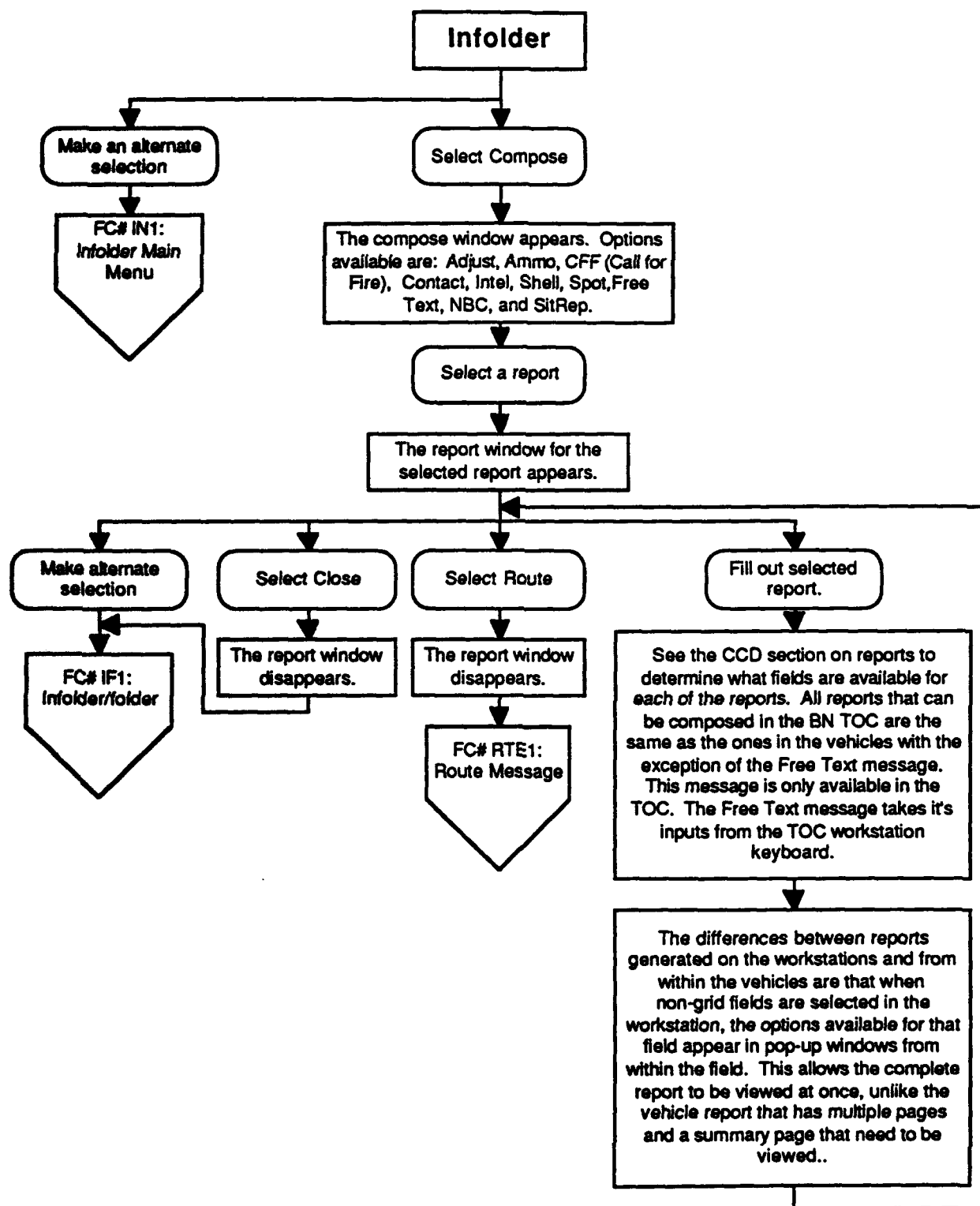


Figure A-13. Compose Message (FC# CM1)

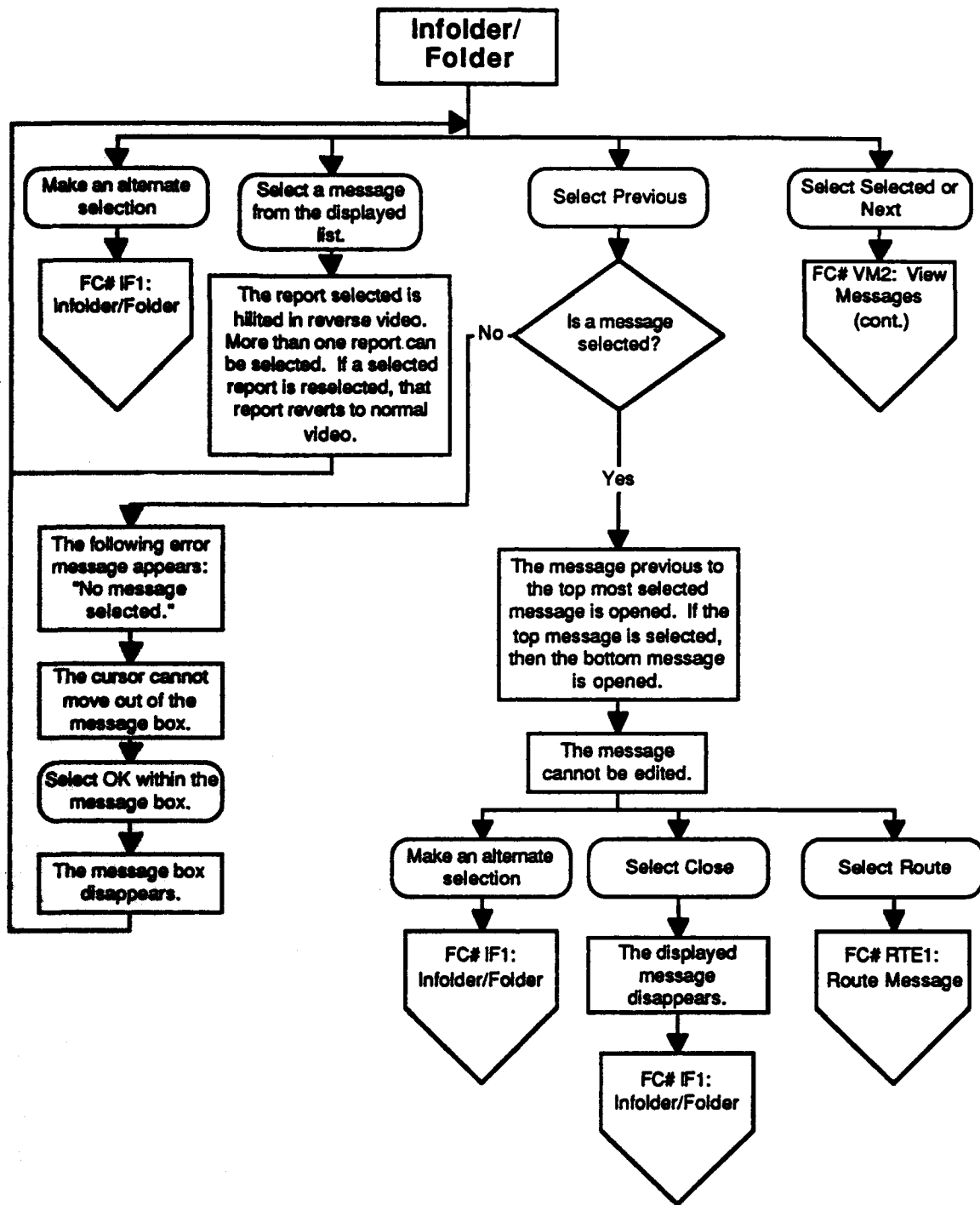


Figure A-14. View Messages (FC# VM1)

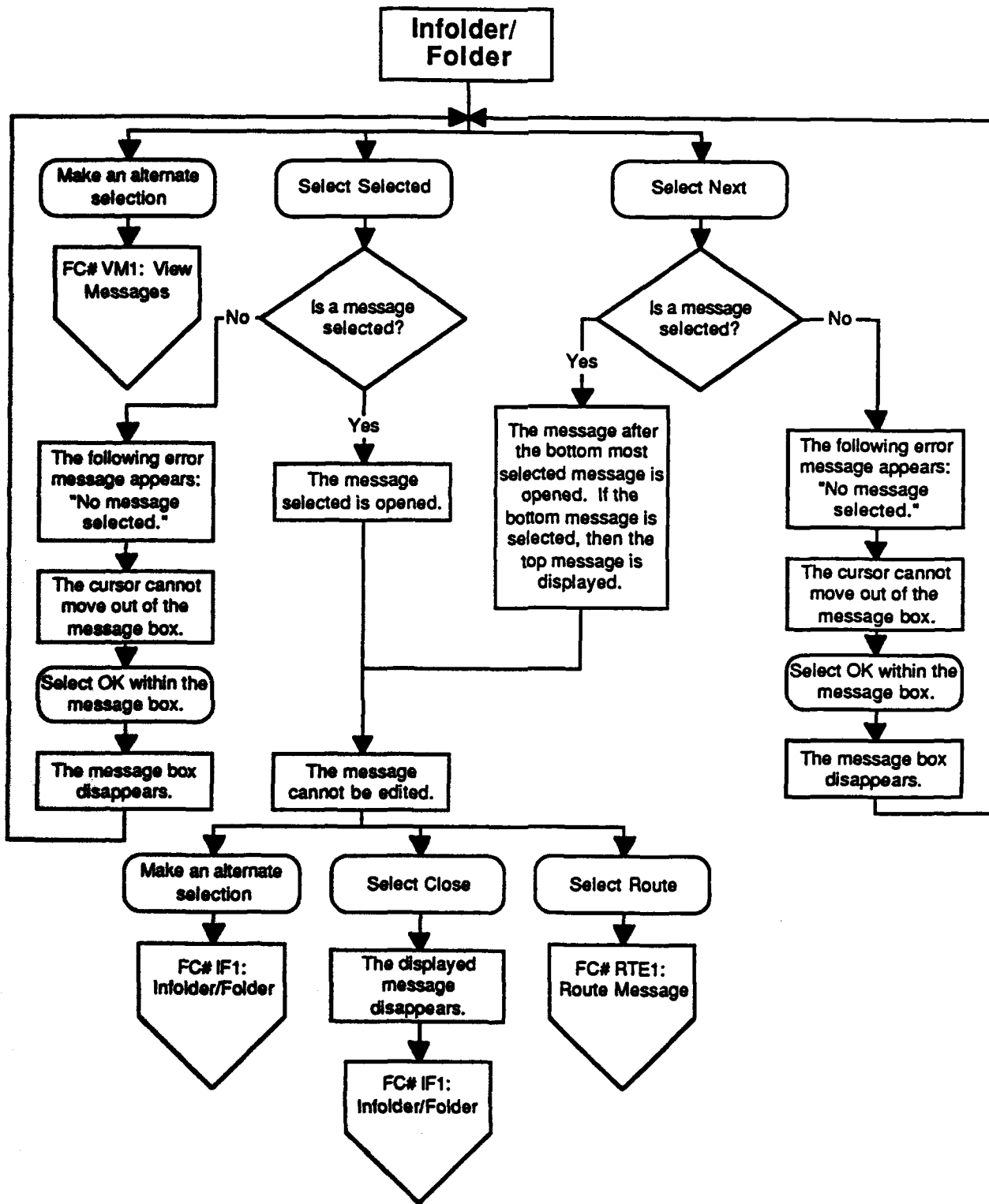


Figure A-15. View Messages (cont.) (FC# VM2)

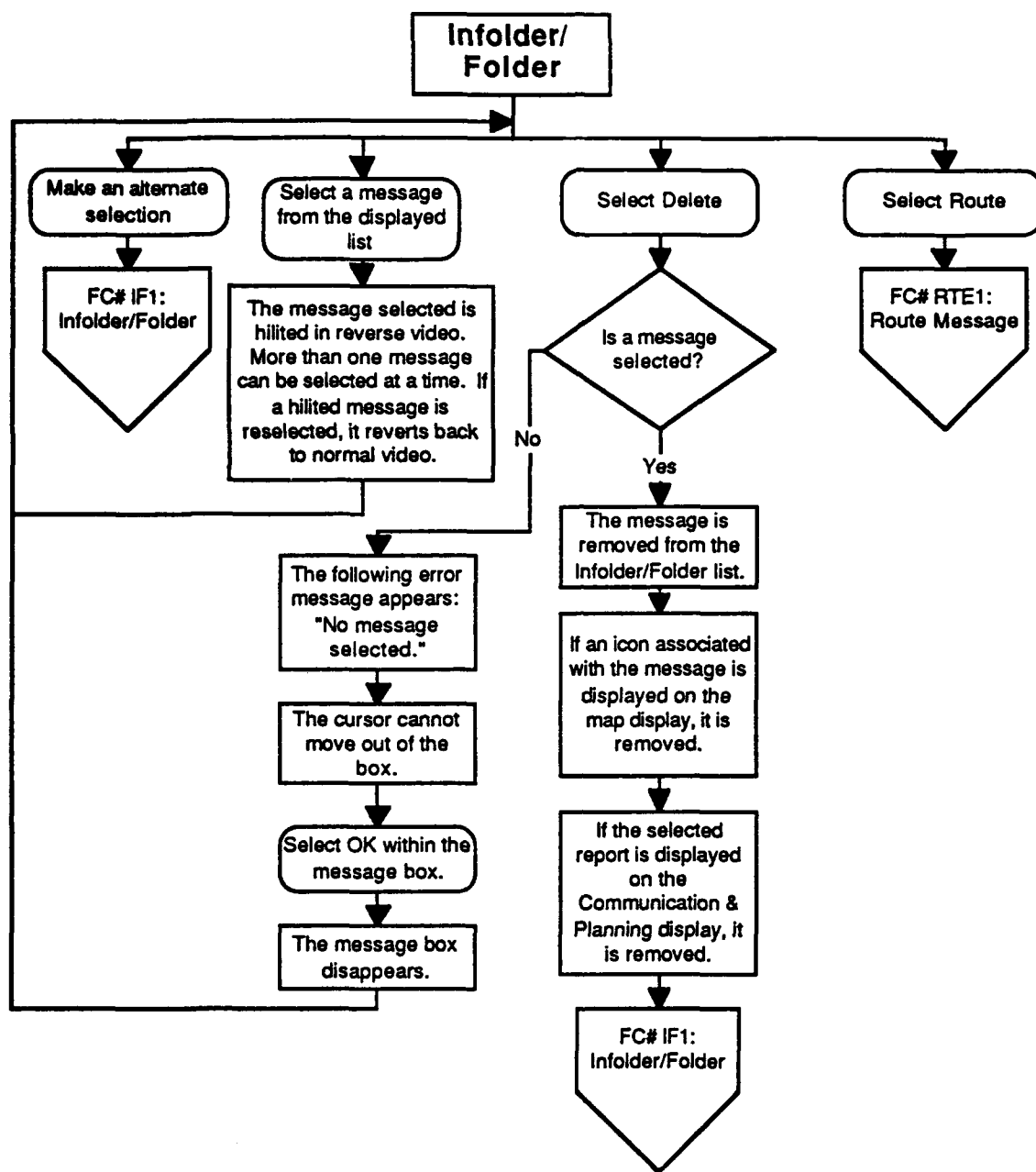


Figure A-16. Dispose of Messages (FC# DM1)

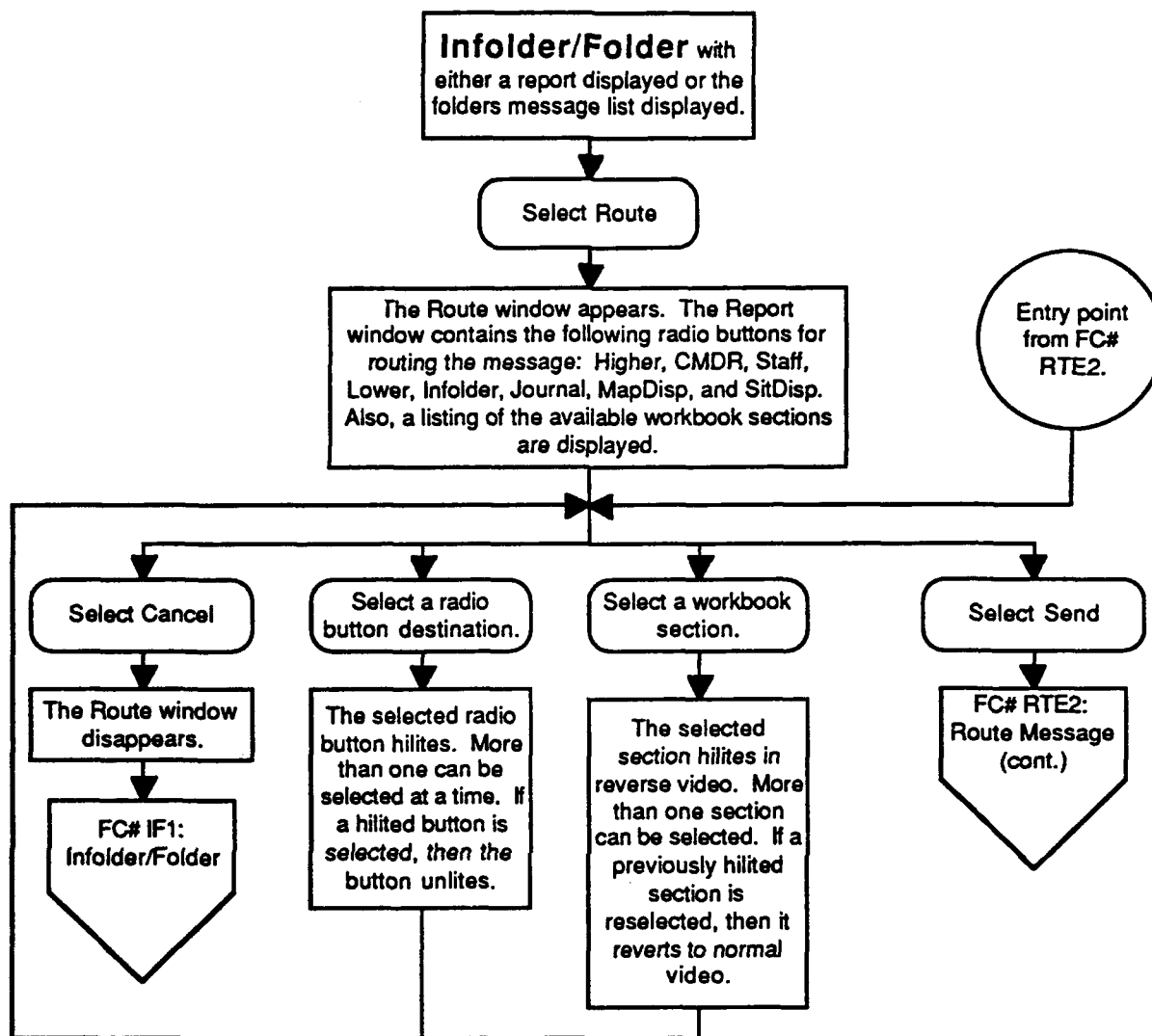
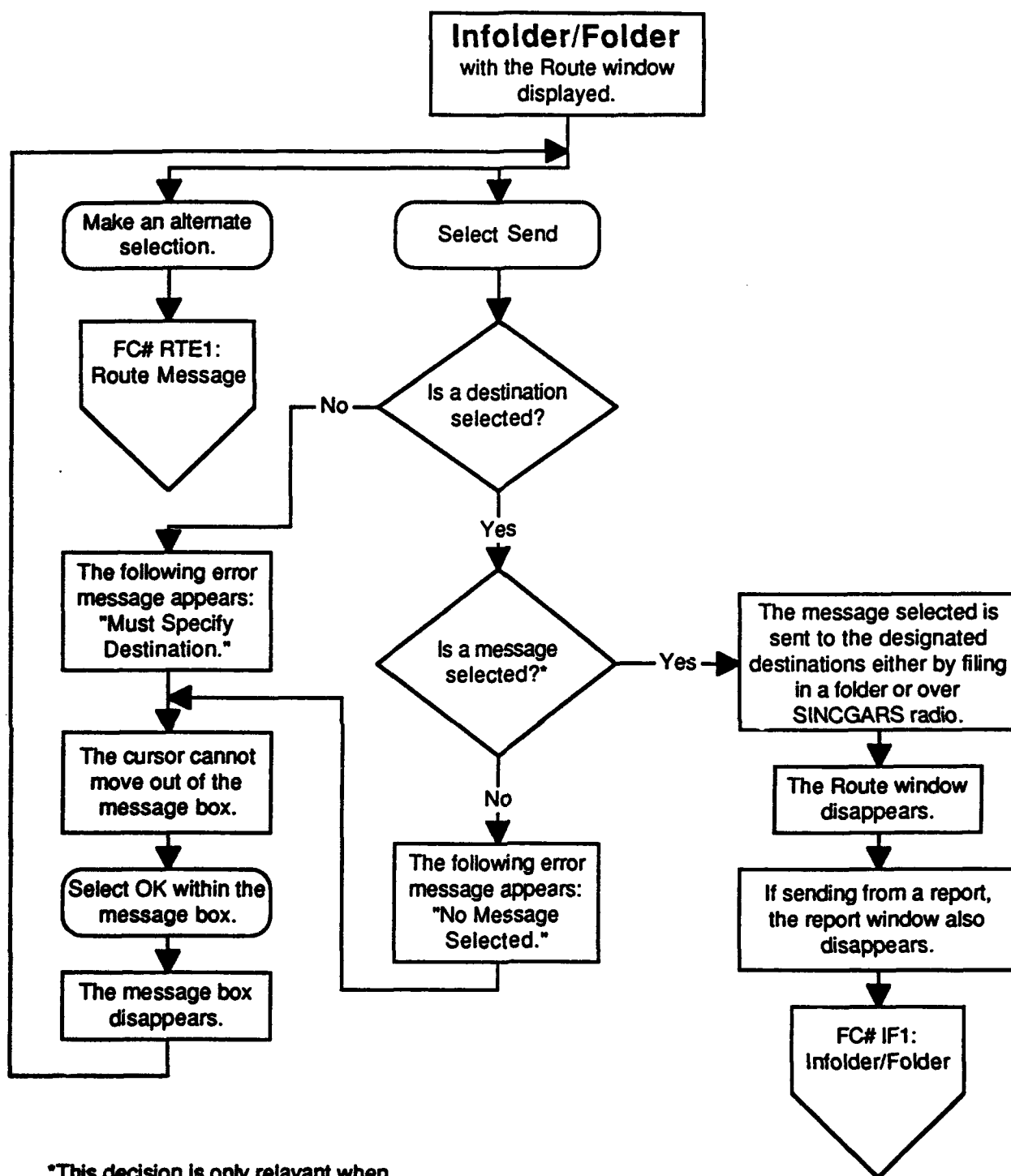
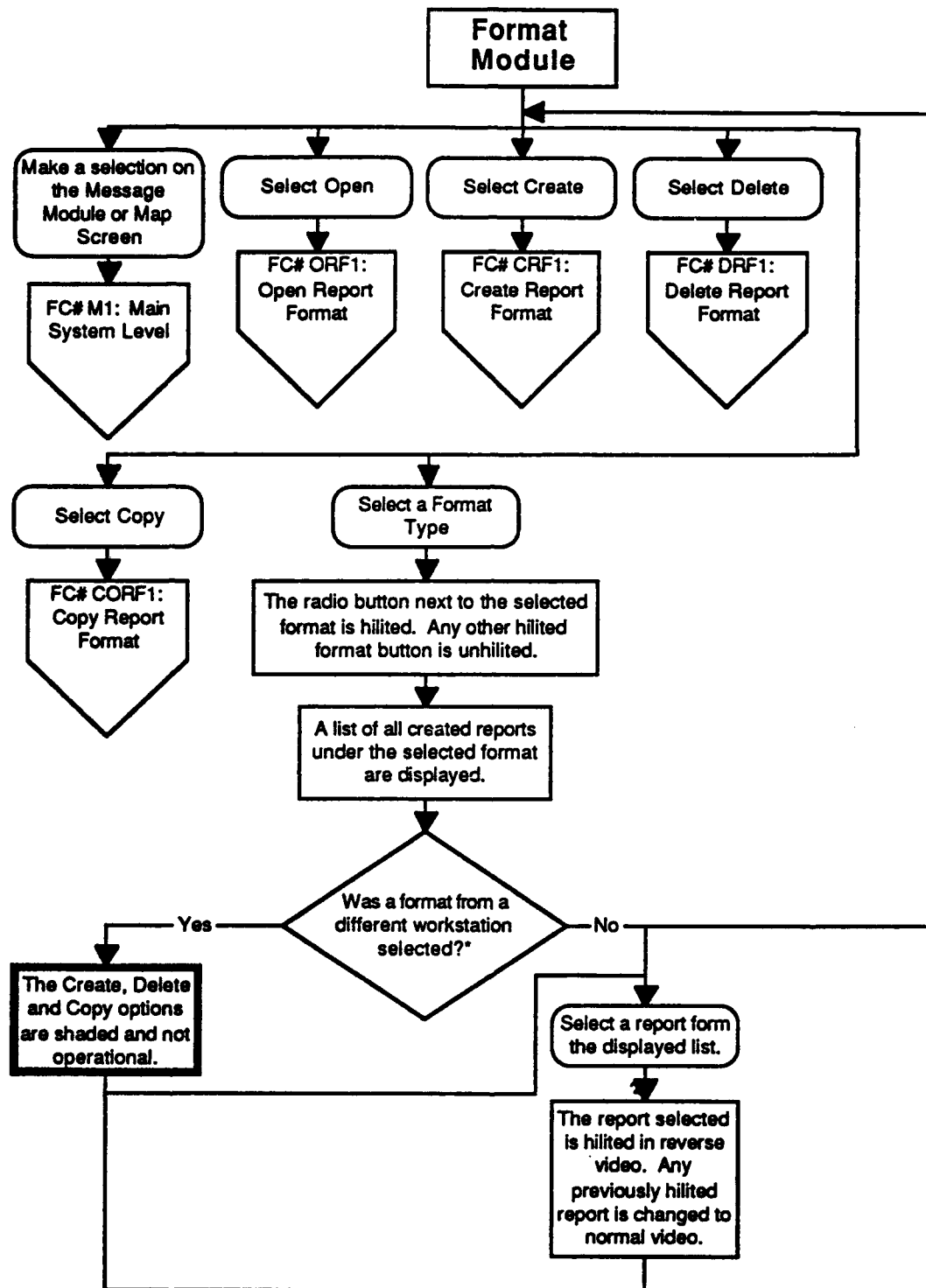


Figure A-17. Route Message (FC# RTE1)



*This decision is only relevant when routing a message from a folder. If routing from a displayed report, that report is sent.

Figure A-18. Route Message (cont.) (FC# RTE2)



*-The following are formats for the S2 workstation:
 AnalAreaOps, Collection, IntelEst, and PerInt.
 -The following are format for the S3 workstation: EST/Sit,
 OpnsOrd, OpnSit, PerOpnRpt, and RoadMvt

Figure A-19. Format Module (FC# FM1)

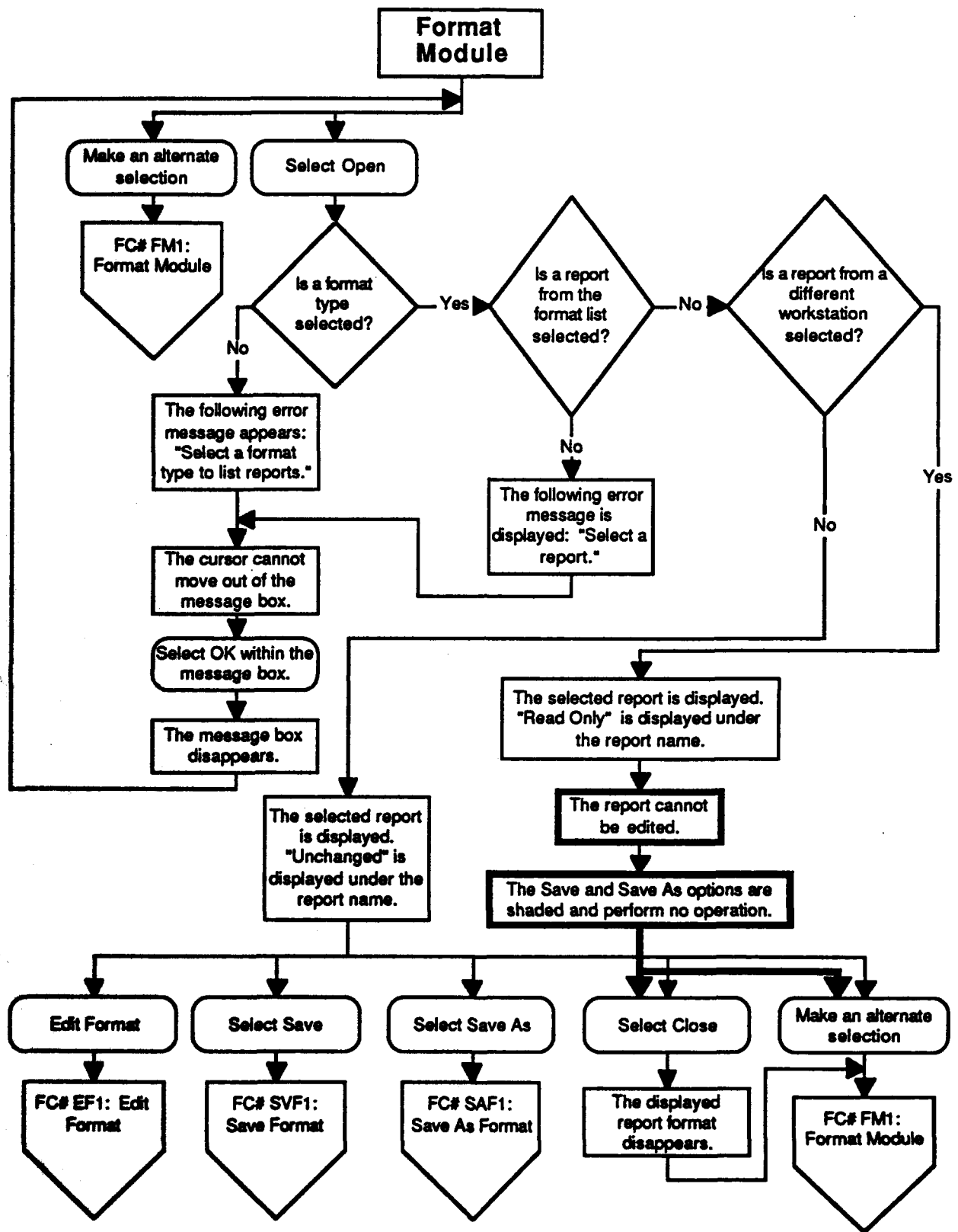


Figure A-20. Open Report Format (FC# ORF1)

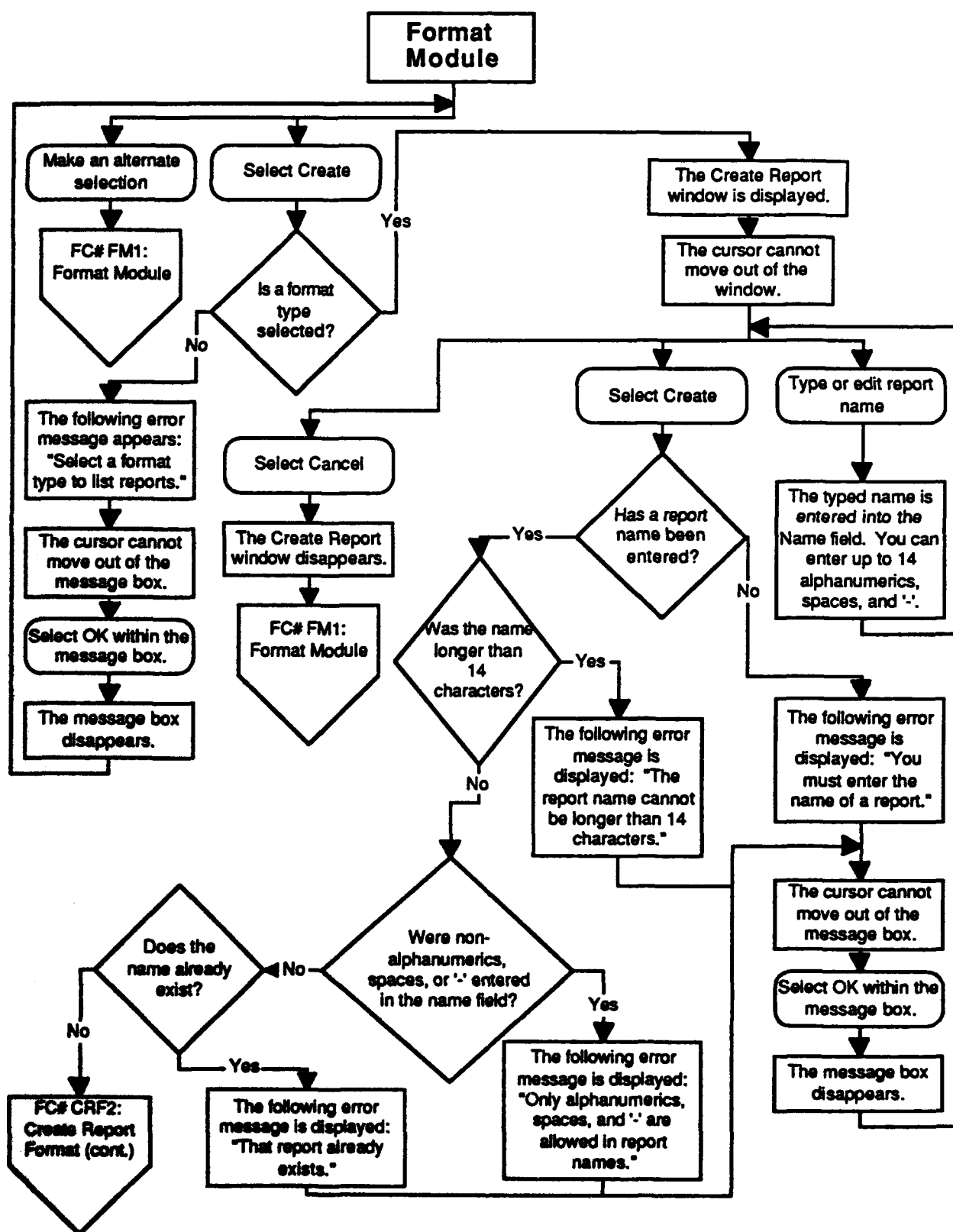


Figure A-21. Create Report Format FC# (CRF1)

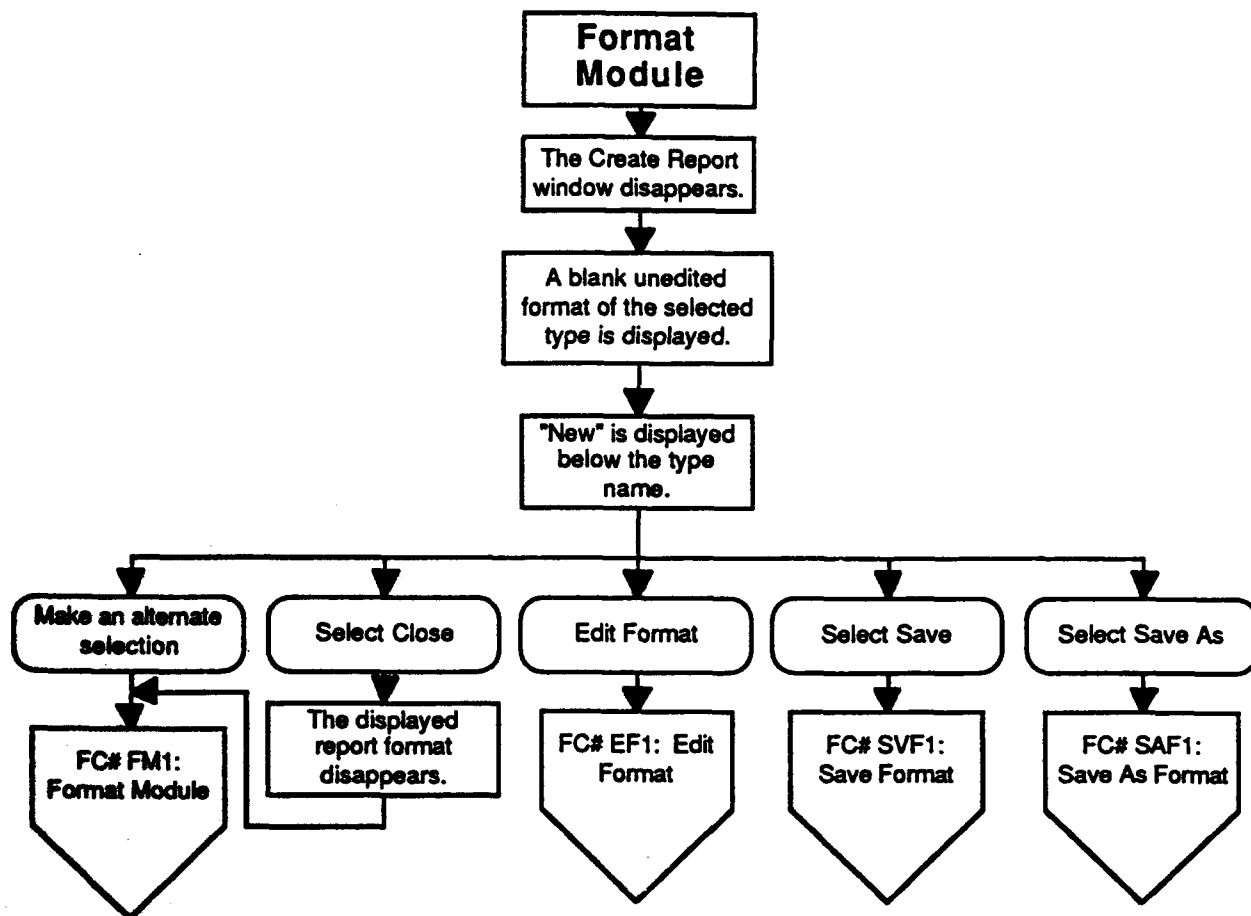


Figure A-22. Create Report Format (cont.) (FC# CRF2)

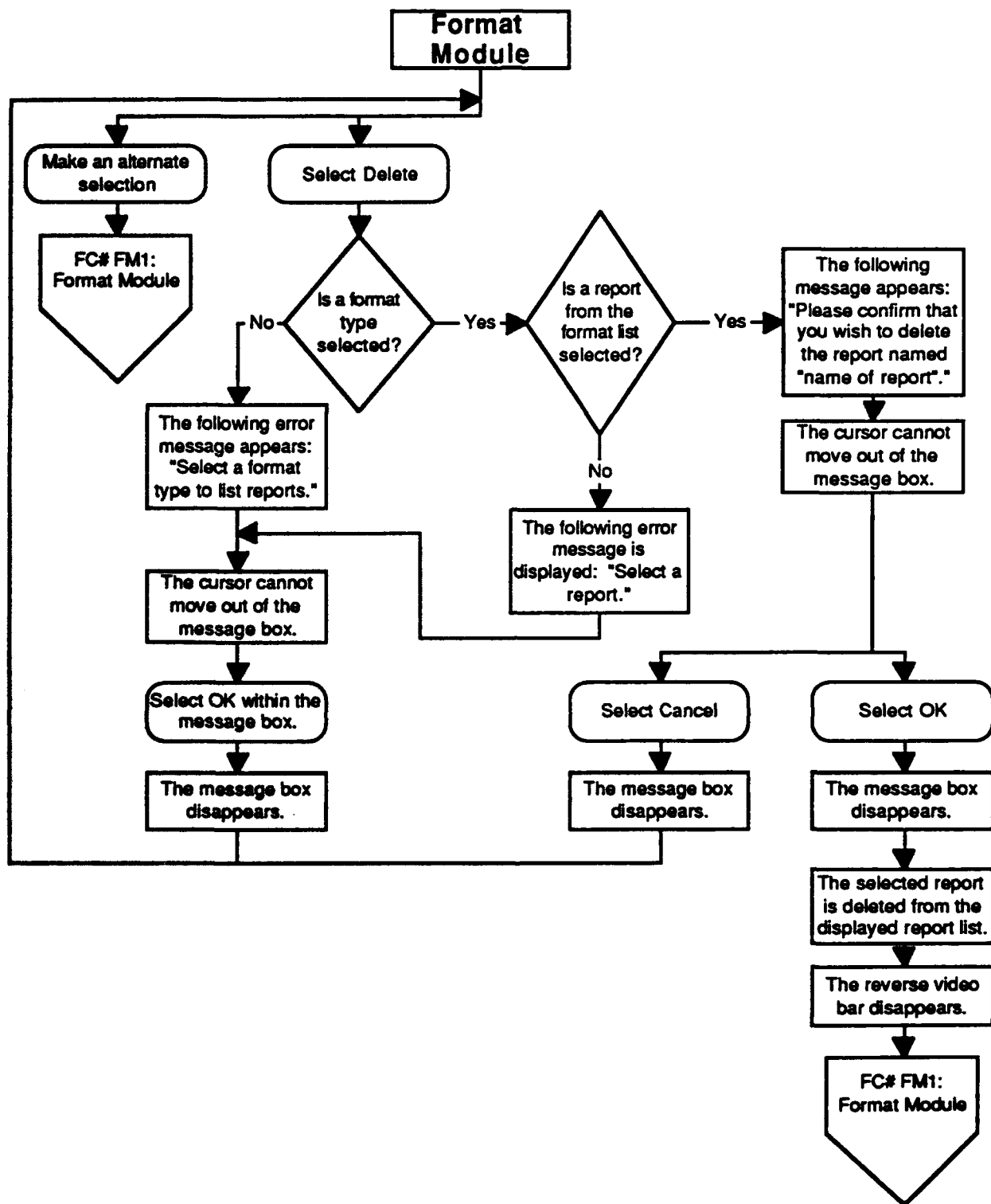


Figure A-23. Delete Report Format (FC# DRF1)

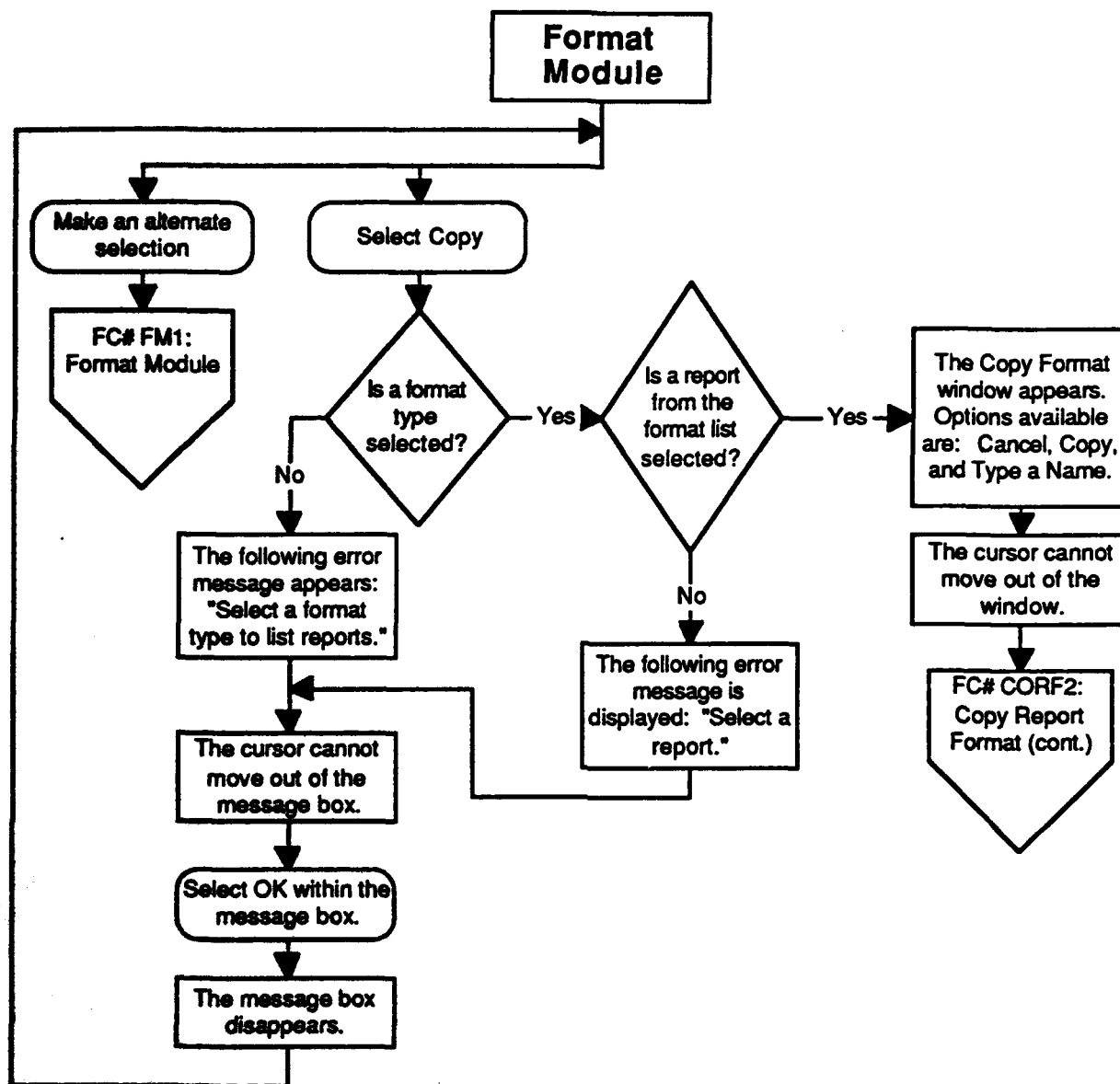


Figure A-24. Copy Report Format (FC# CORF1)

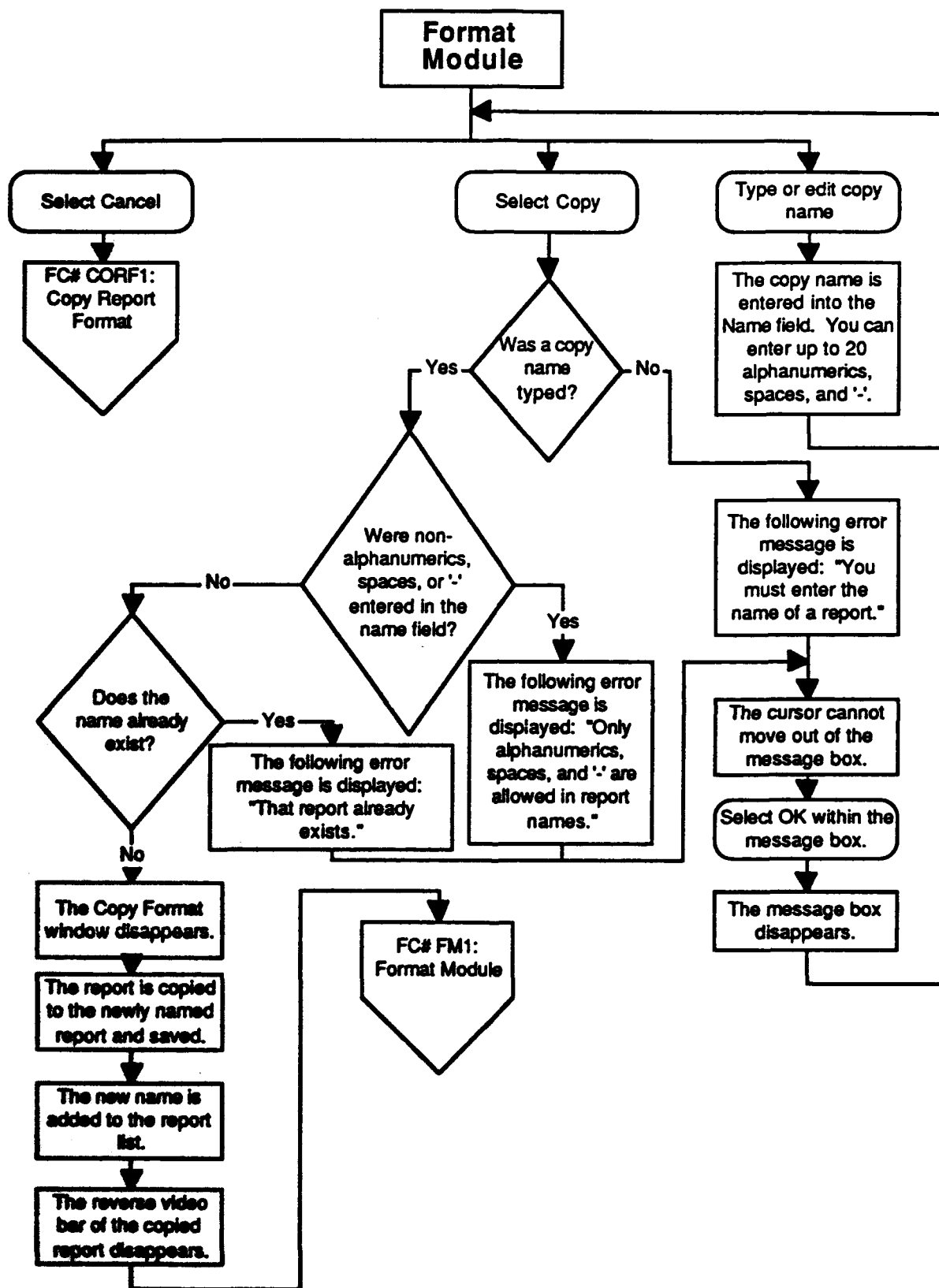
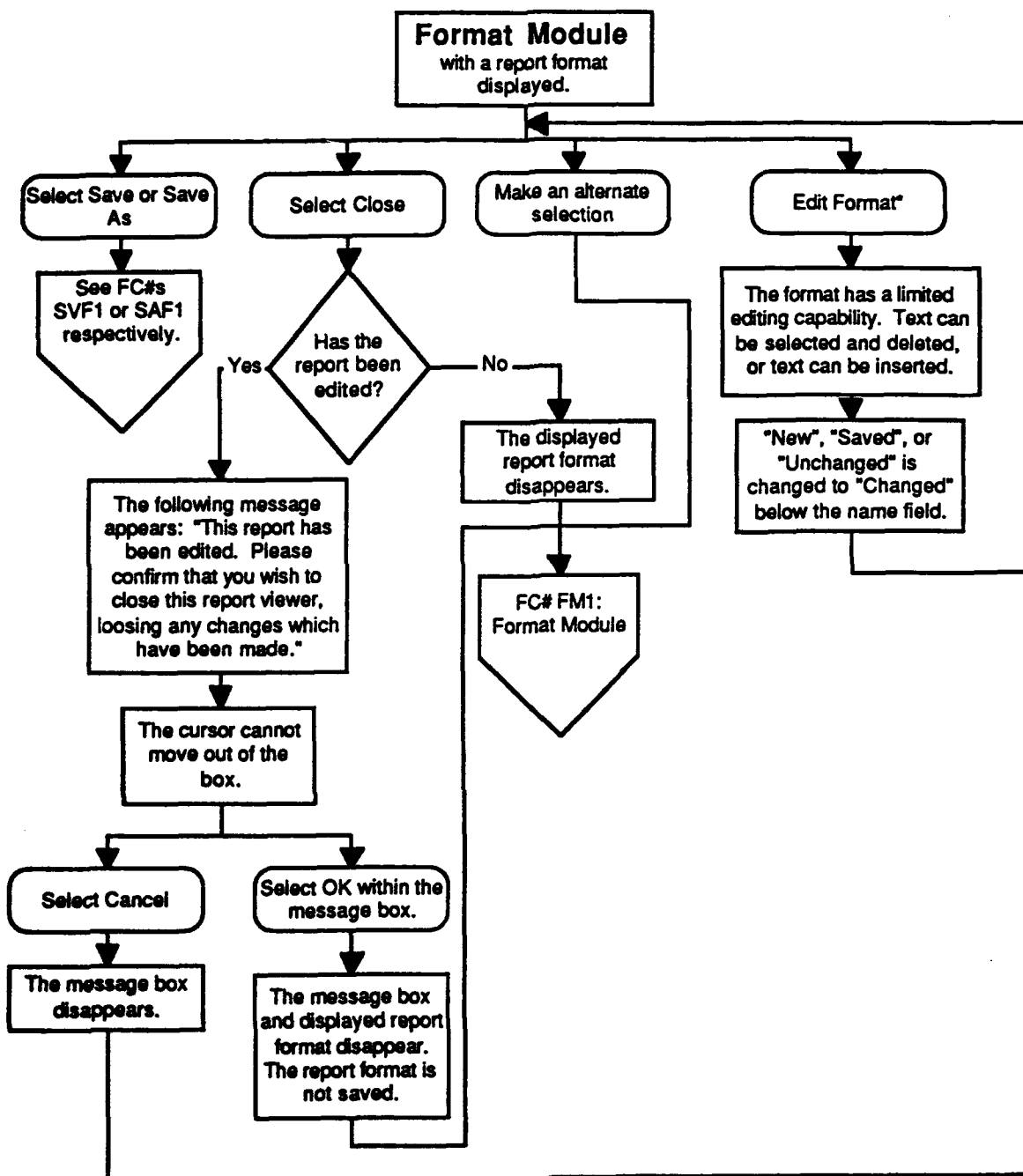


Figure A-25. Copy Report Format (cont.) (FC# CORF2)



*The cursor must remain in the report format window in order to be edited.

Figure A-26. Edit Format (FC# EF1)

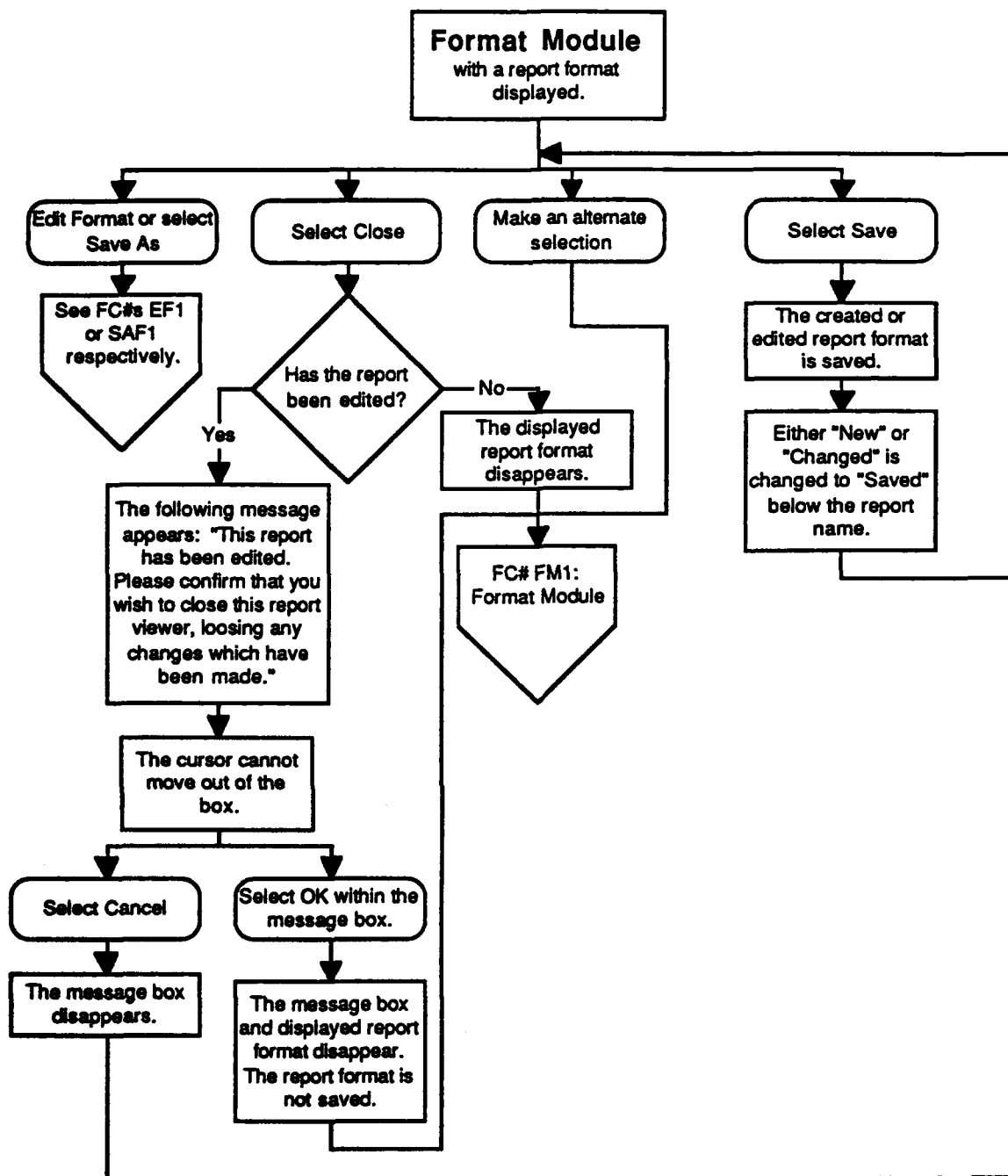


Figure A-27. Save Format (FC# SVF1)

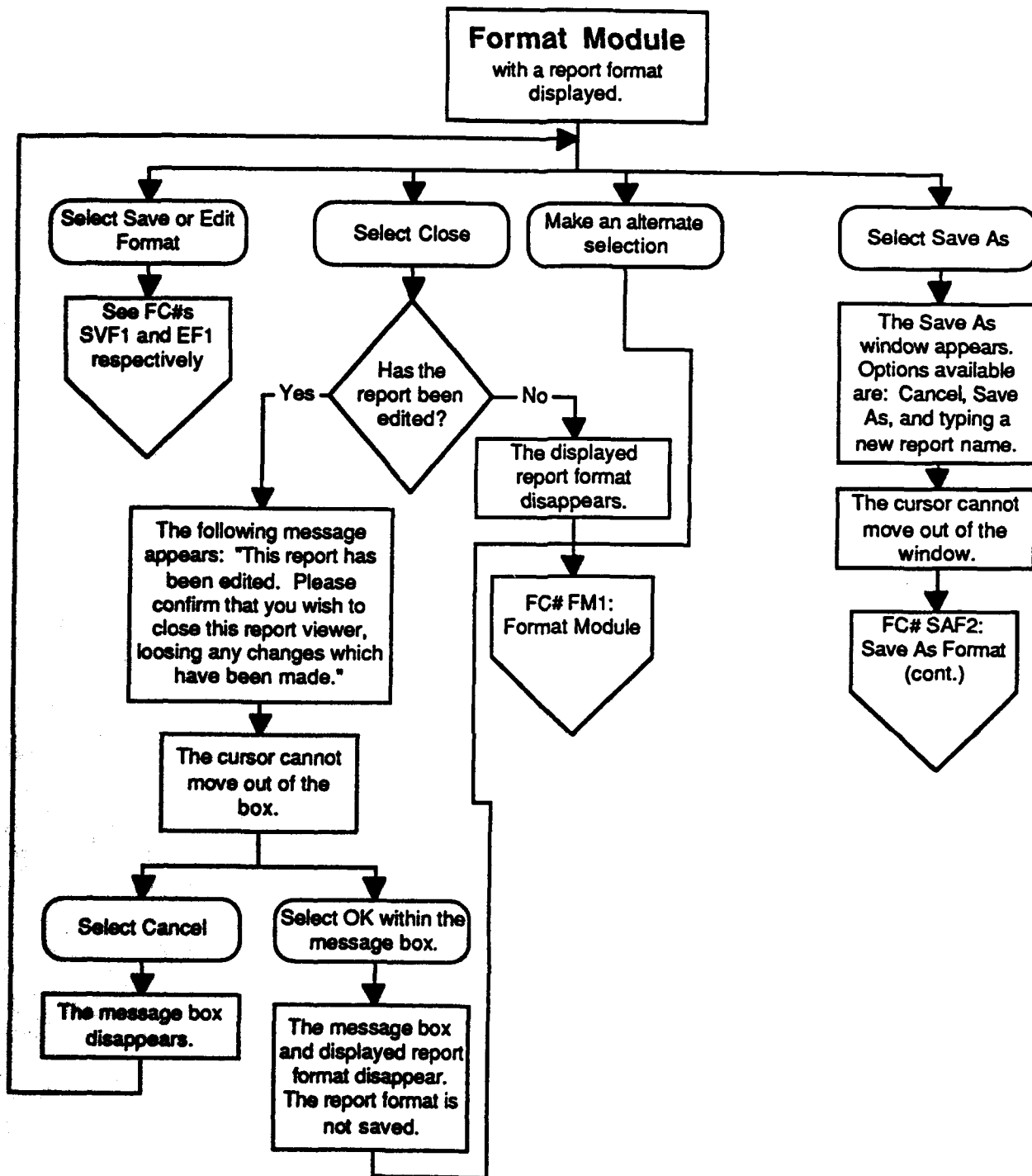


Figure A-28. Save As Format (FC# SAF1)

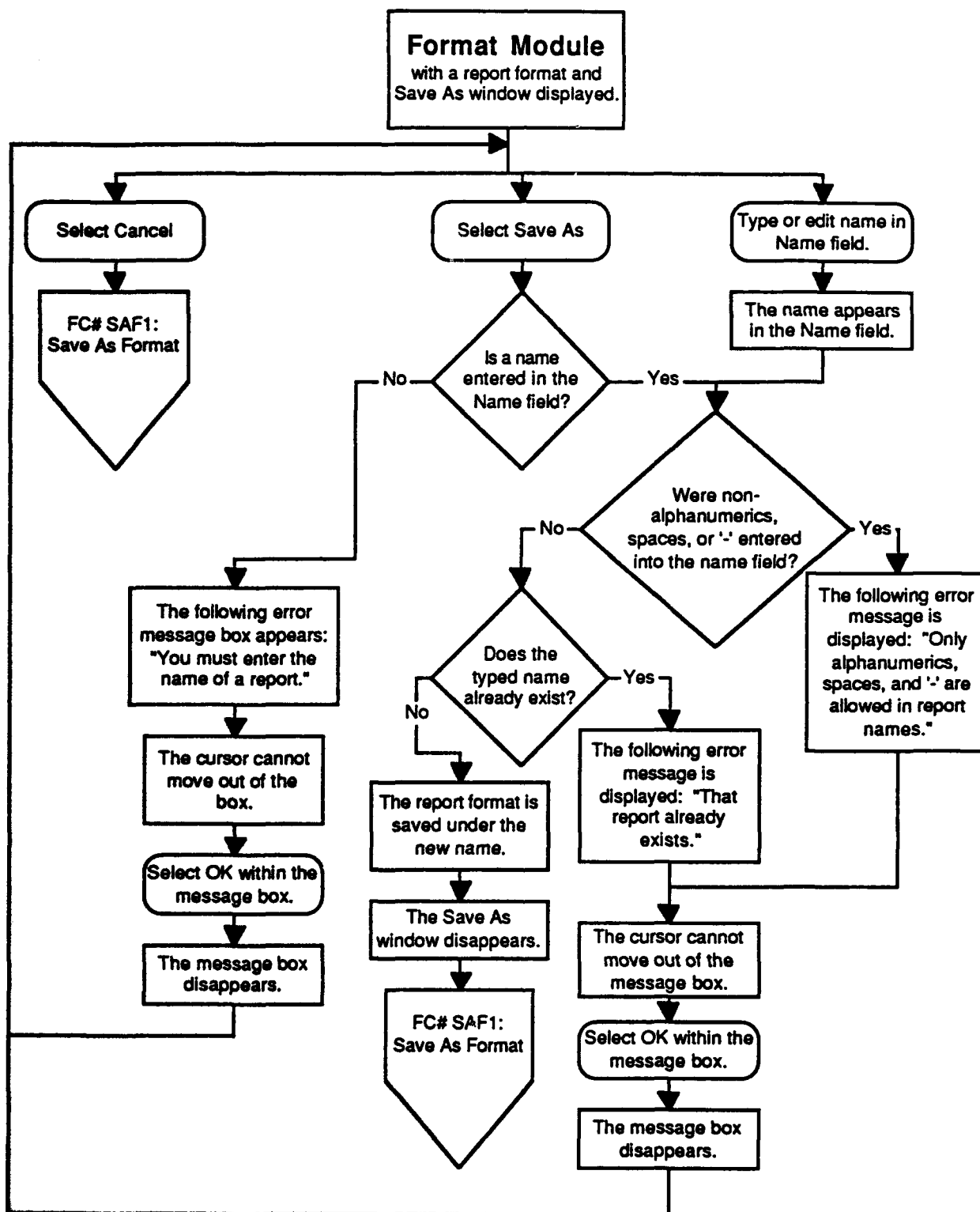


Figure A-29. Save As Format (cont.) (FC# SAF2)

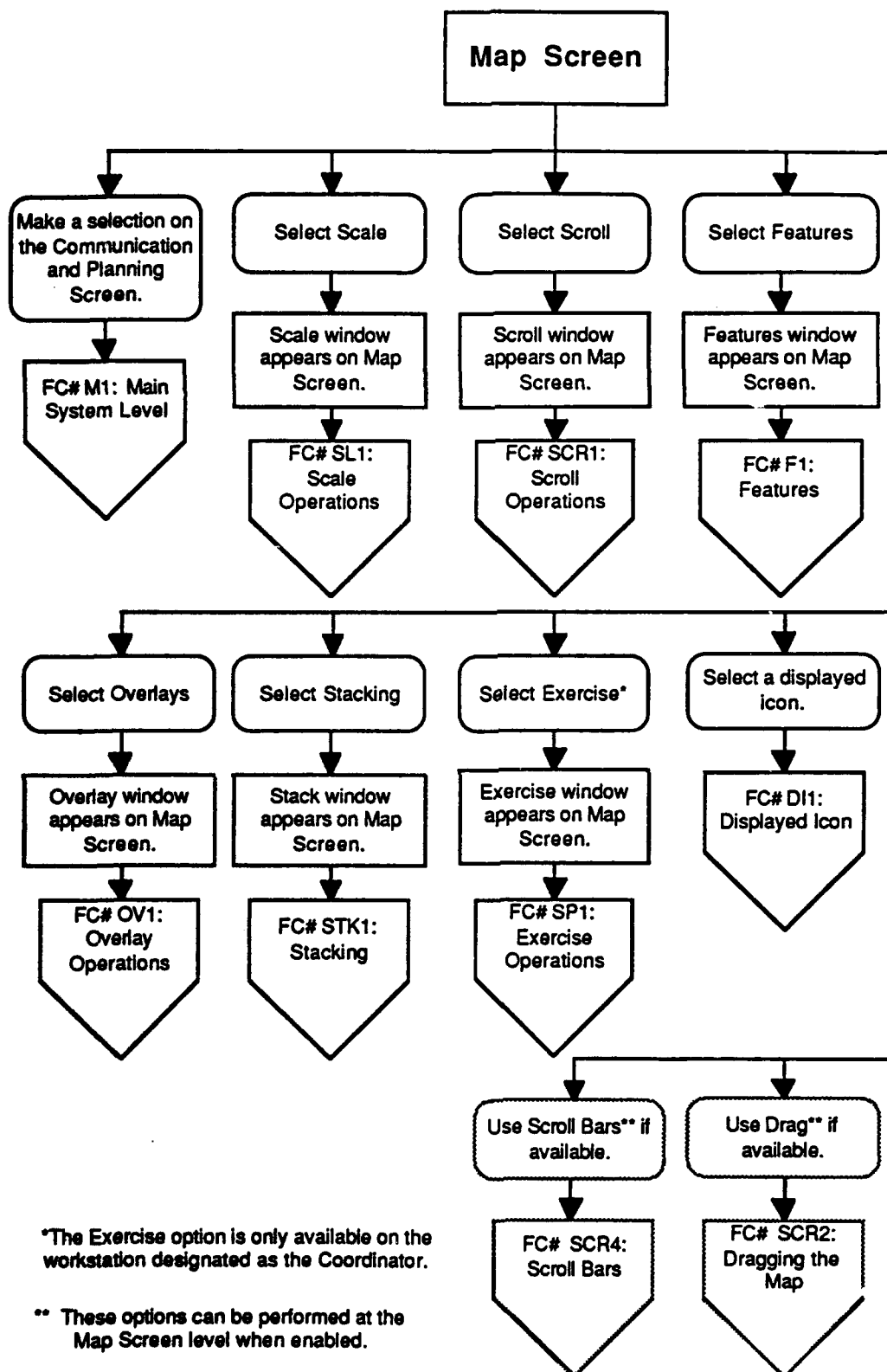


Figure A-30. Map Screen (FC# MS1)

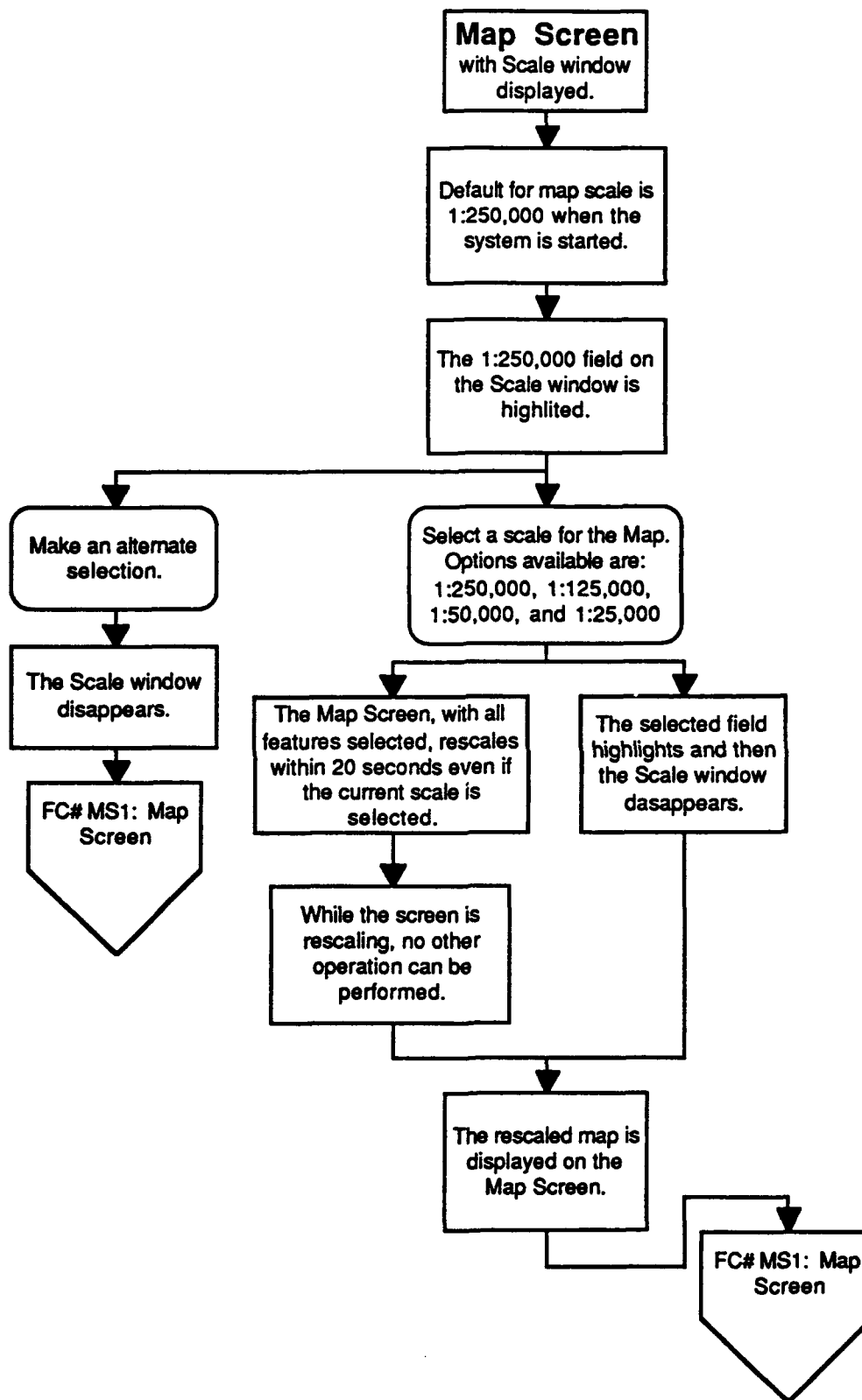
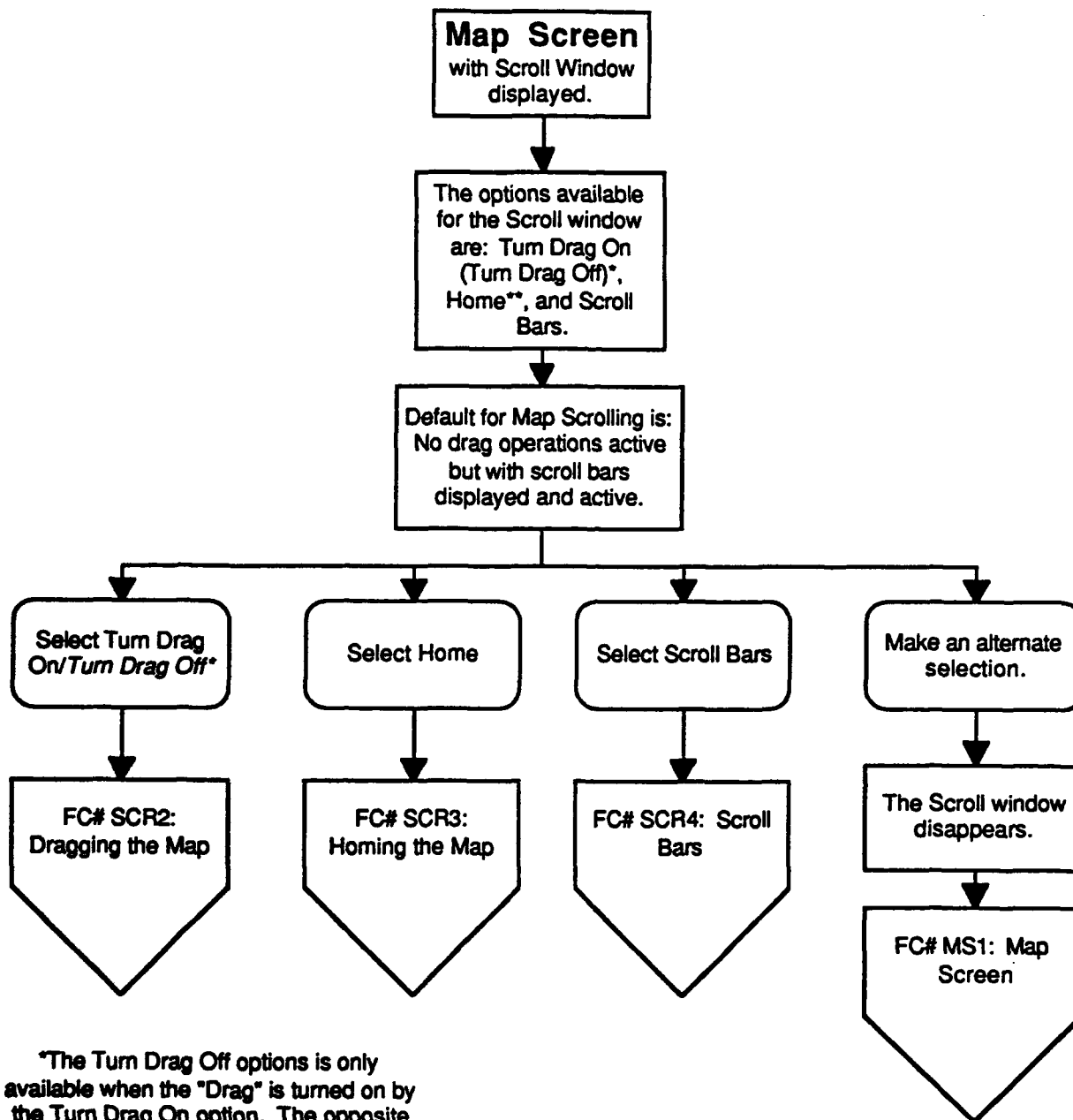


Figure A-31. Scale Operations (FC# SL1)



*The Turn Drag Off options is only available when the "Drag" is turned on by the Turn Drag On option. The opposite is true when the "Drag" is turned off.

**The Home function is only available on workstations that are brought up as a Coordinator.

Figure A-32. Scroll Operations (FC# SCR1)

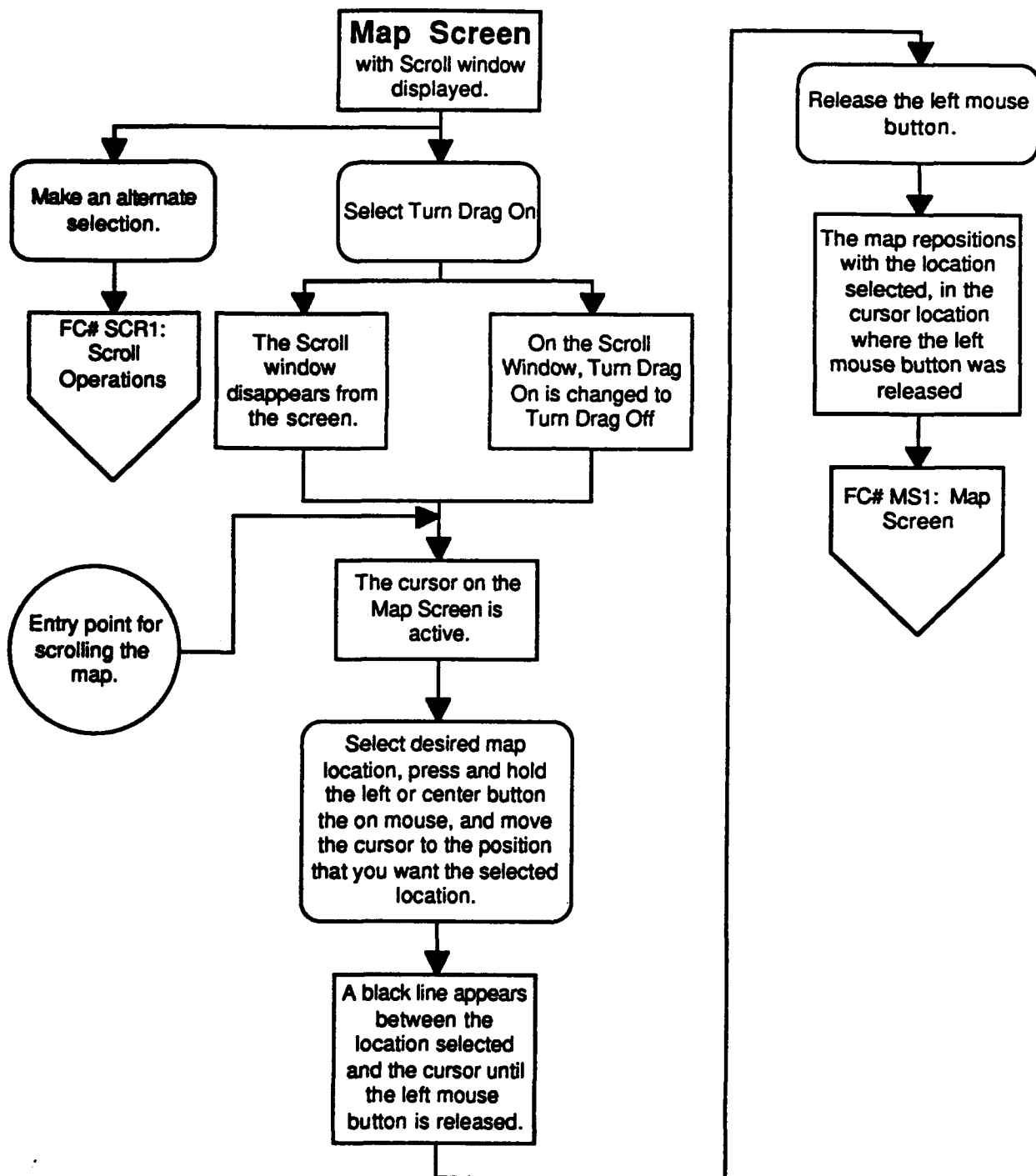
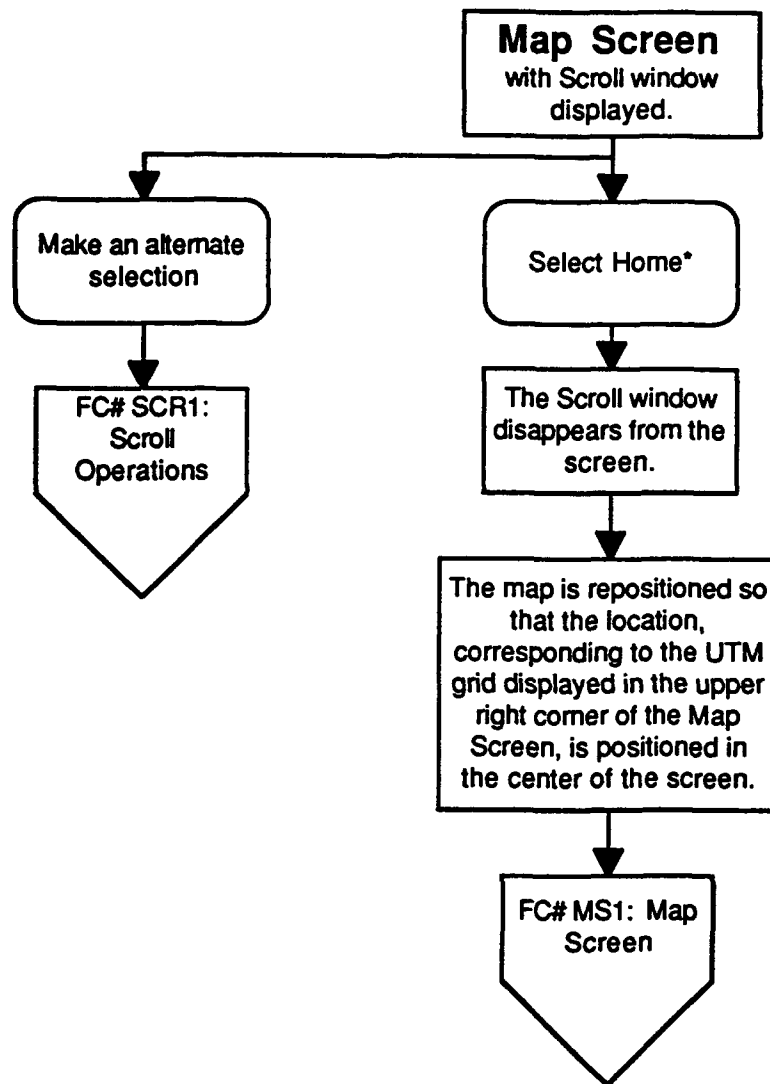


Figure A-33. Dragging the Map (FC# SCR2)



*This function is only available on workstations designated as the Coordinator.

Figure A-34. Homing the Map (FC# SCR3)

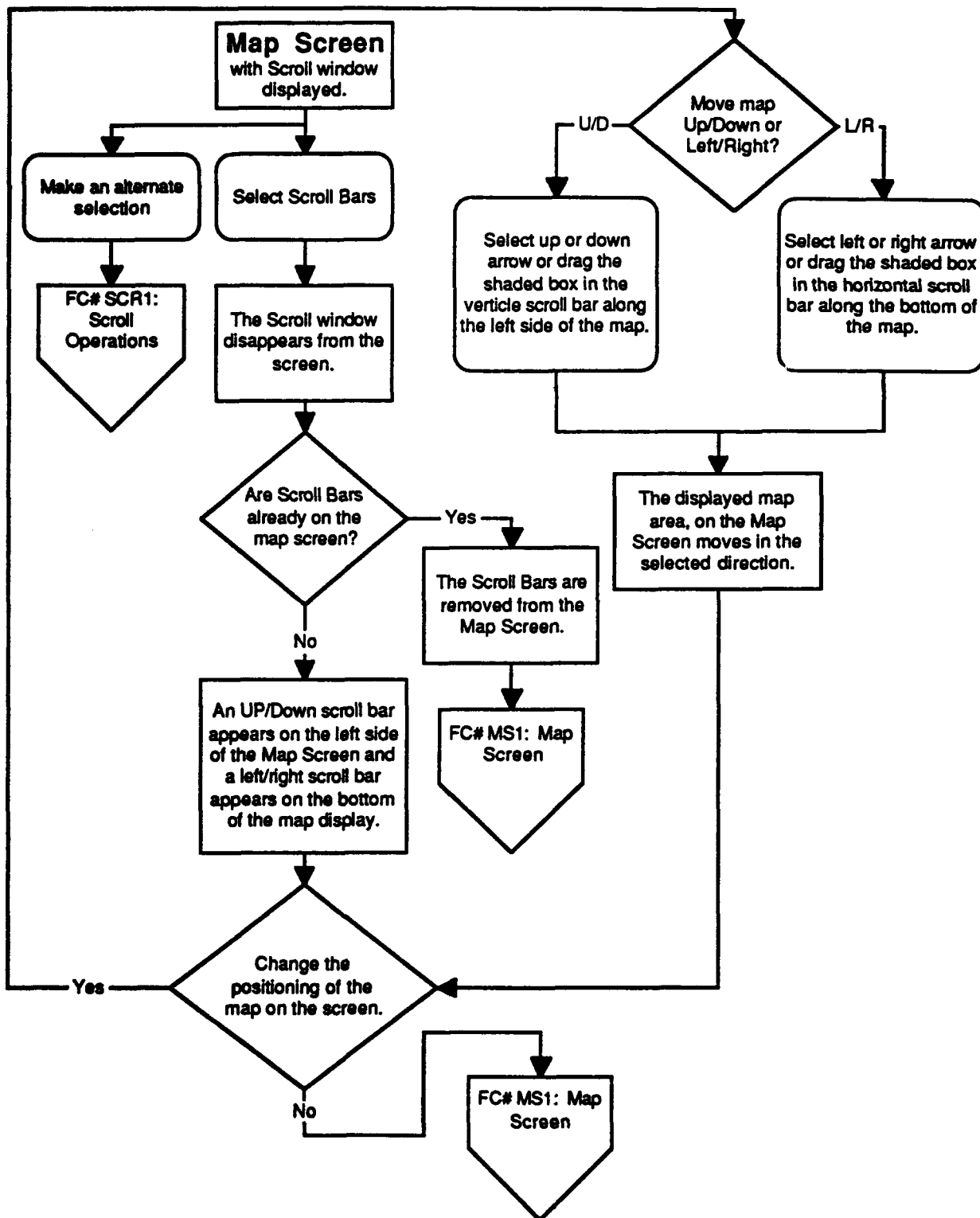
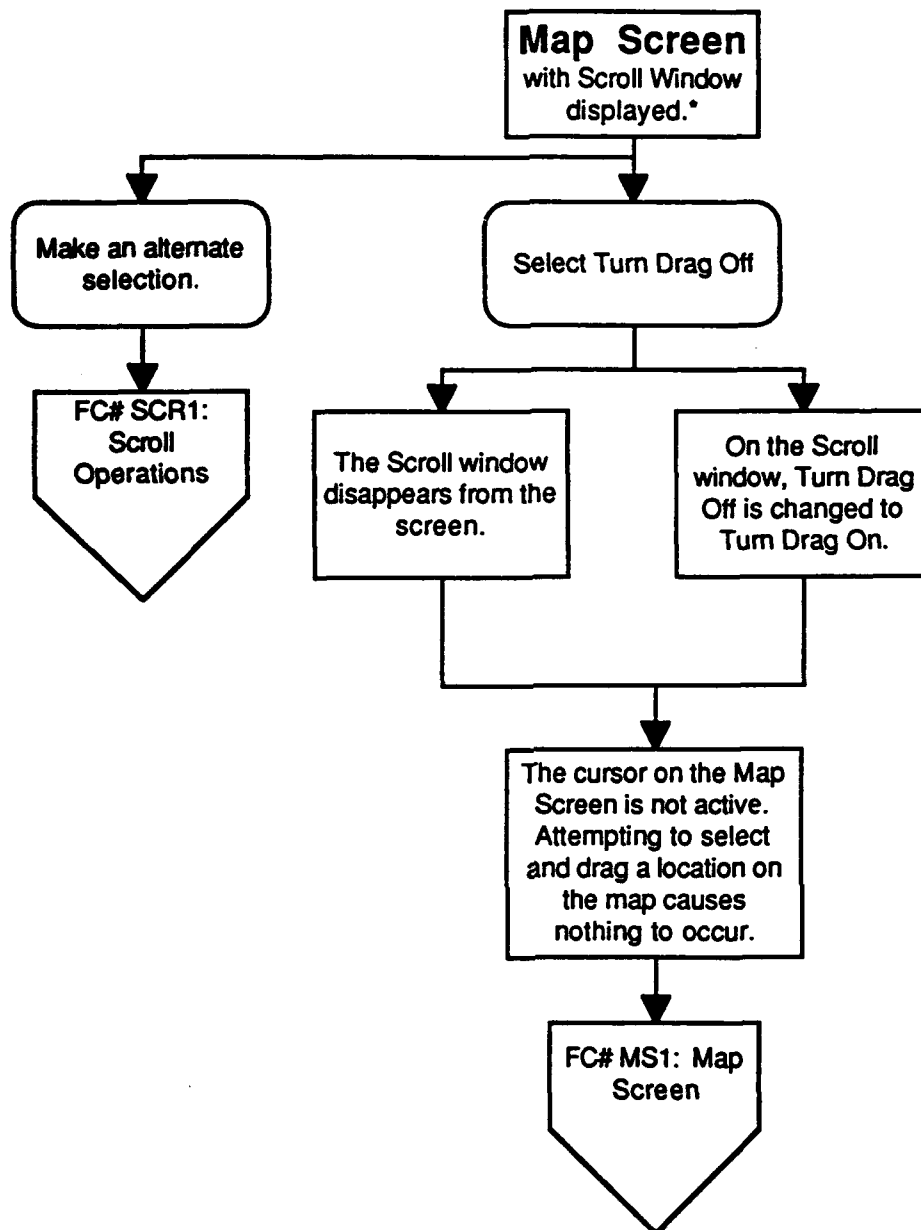


Figure A-35. Scroll Bars (FC# SCR4)



* As stated on FC# MS3, The "Drag" must be on to select this option. The Scroll option must be selected from the Map Screen again in order for the Scroll window to appear.

Figure A-36. Turning Drag Off (FC# SCR5)

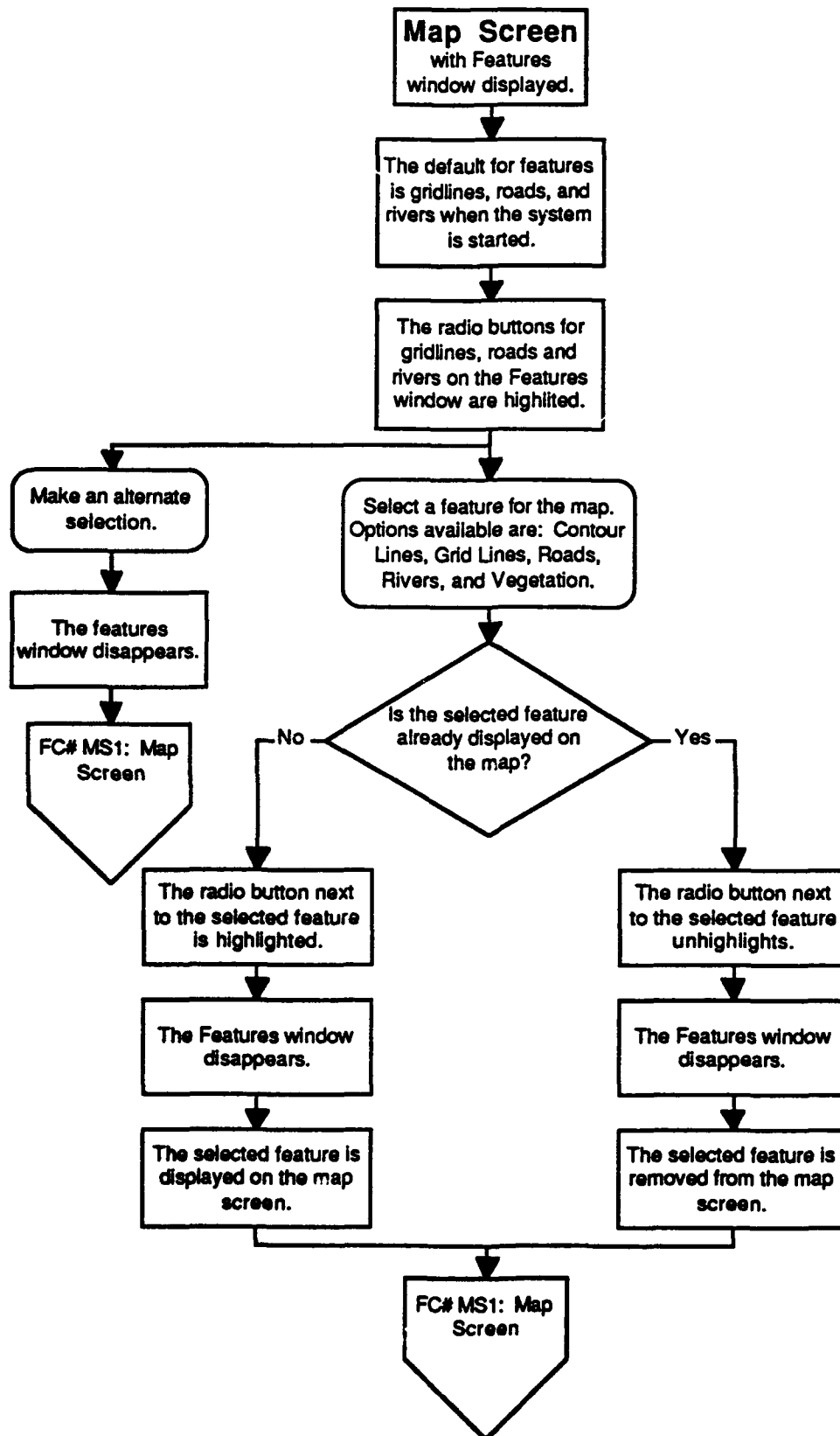
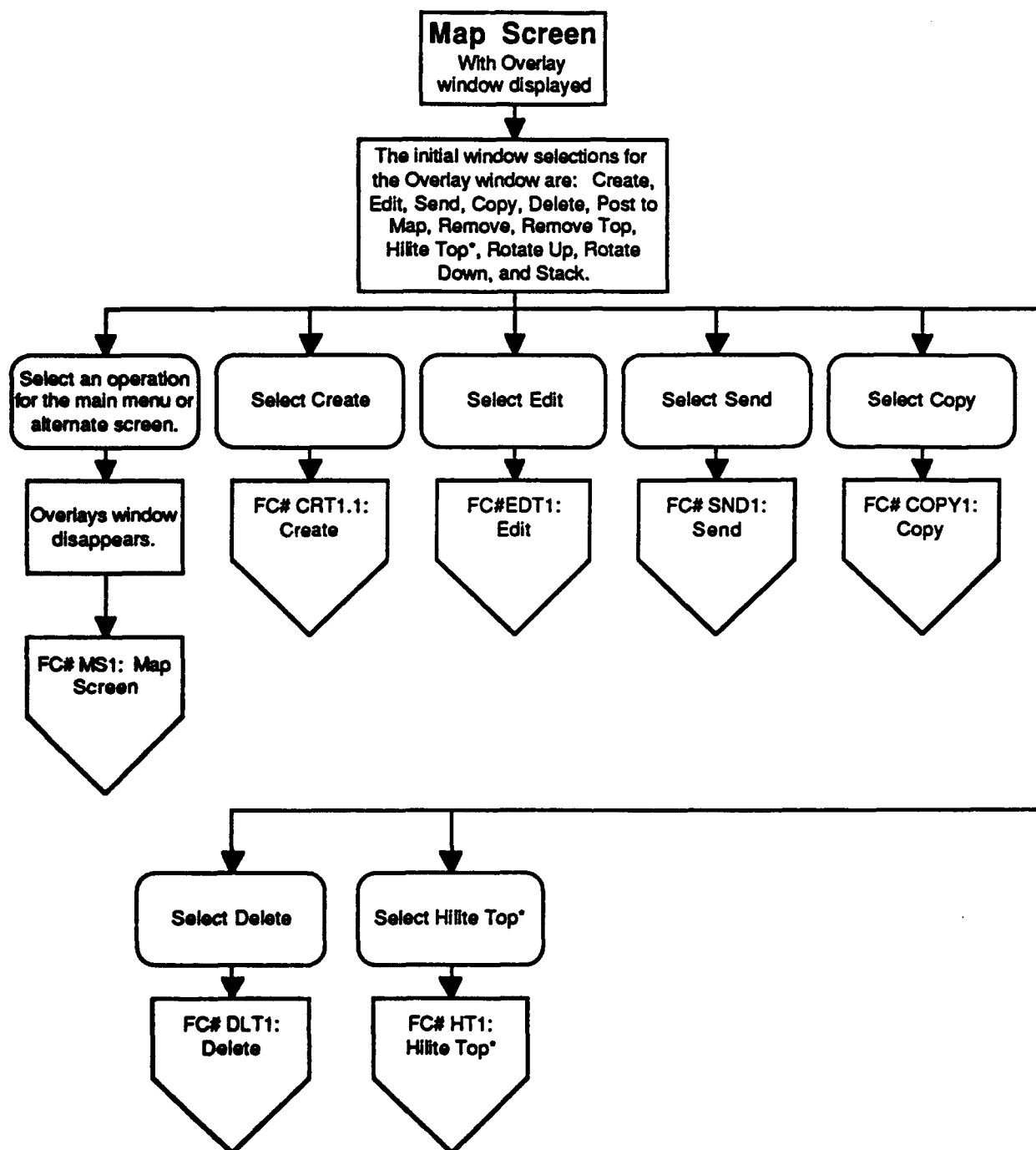


Figure A-37. Features (FC# F1)



*HiLite Top toggles to
UnhiLite Top when it is
selected and vice versa.
Both operations are
explained in FC# HT1.

Figure A-38. Overlay Operations (FC# OV1)

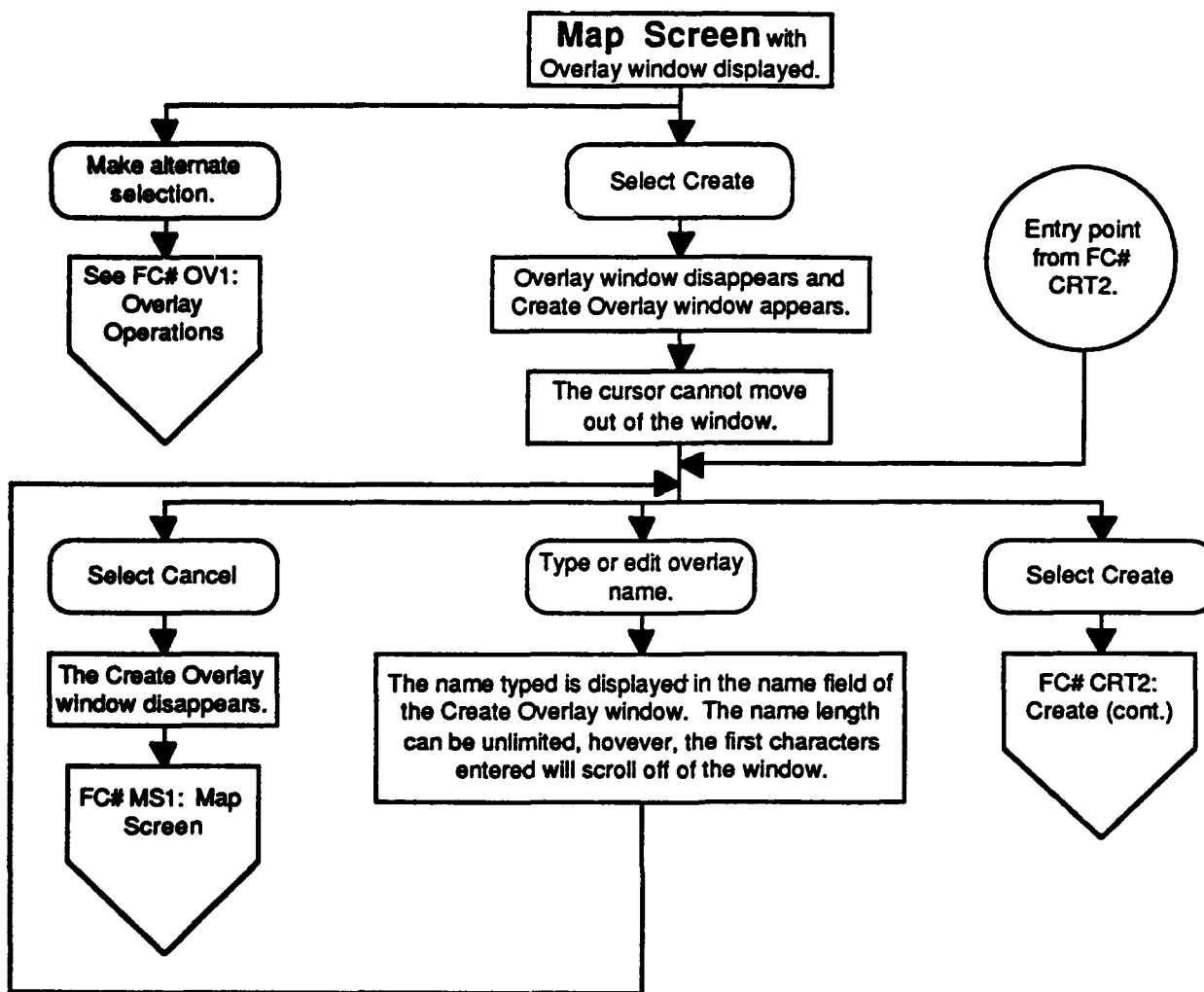


Figure A-39. Create Overlay (FC# CRT1)

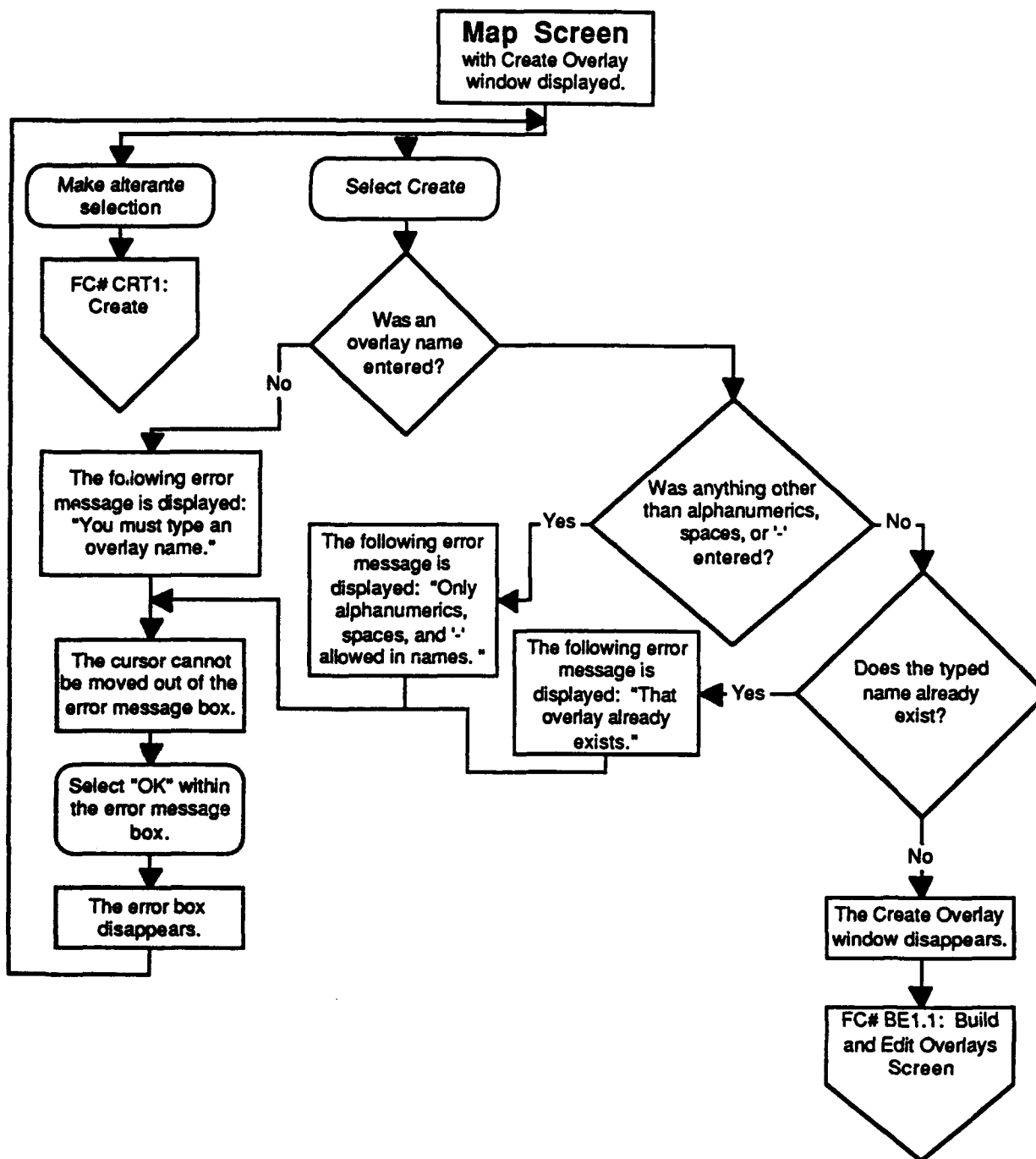


Figure A-40. Create Overlay (cont.) (FC# CRT2)

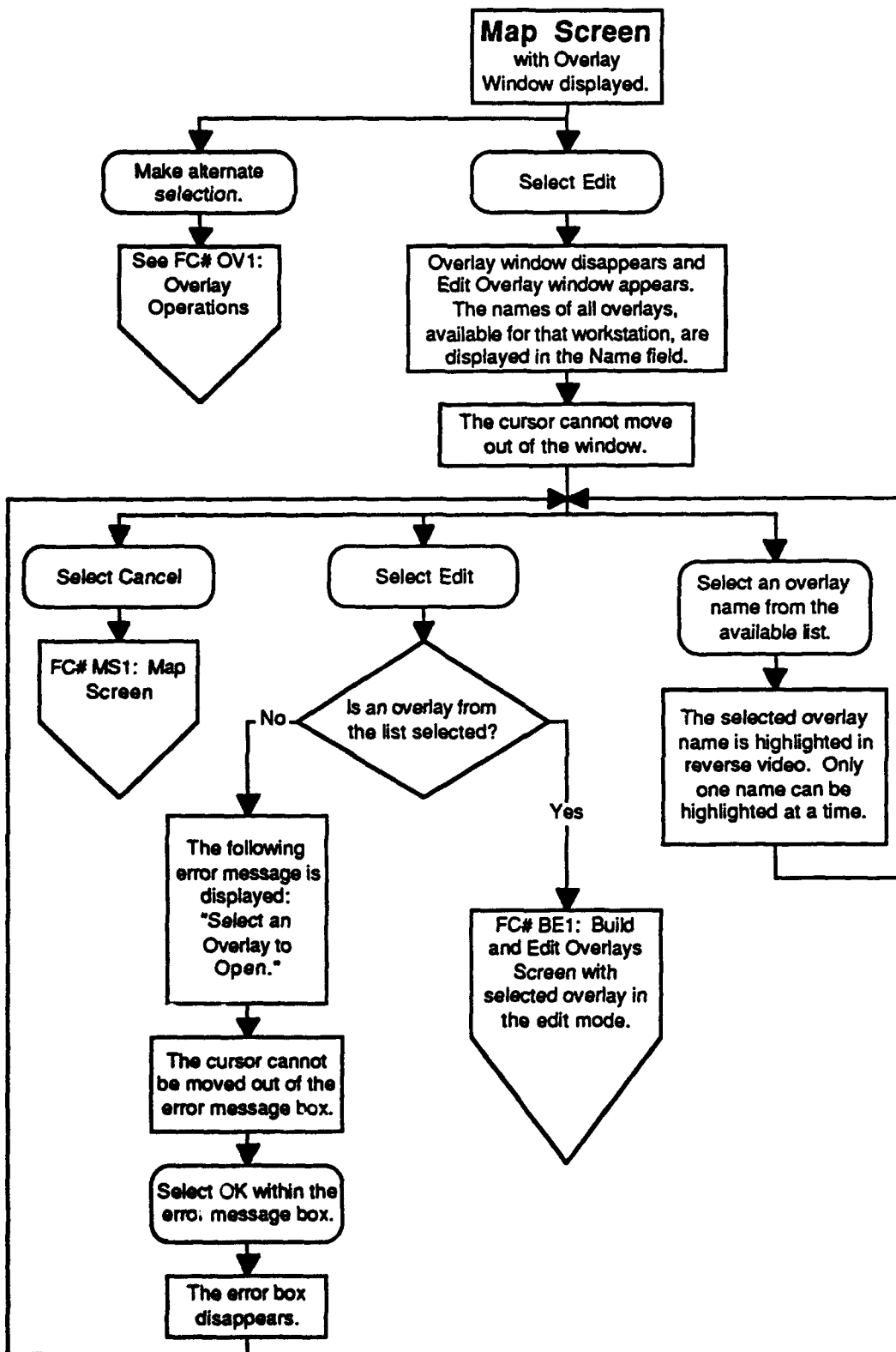


Figure A-41. Edit Overlay (FC# EDT1)

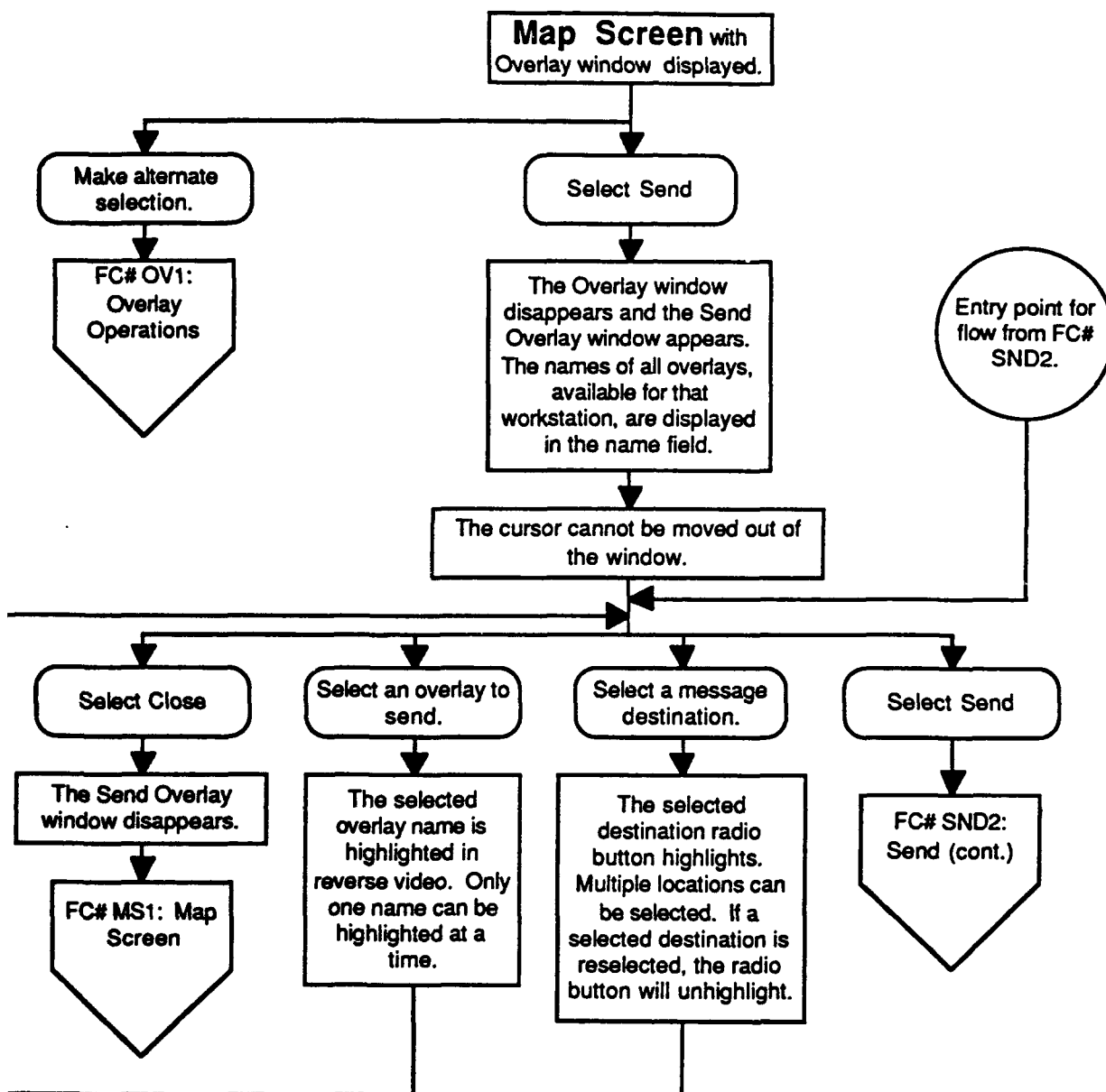


figure A-42. Send Overlay (FC# SND1)

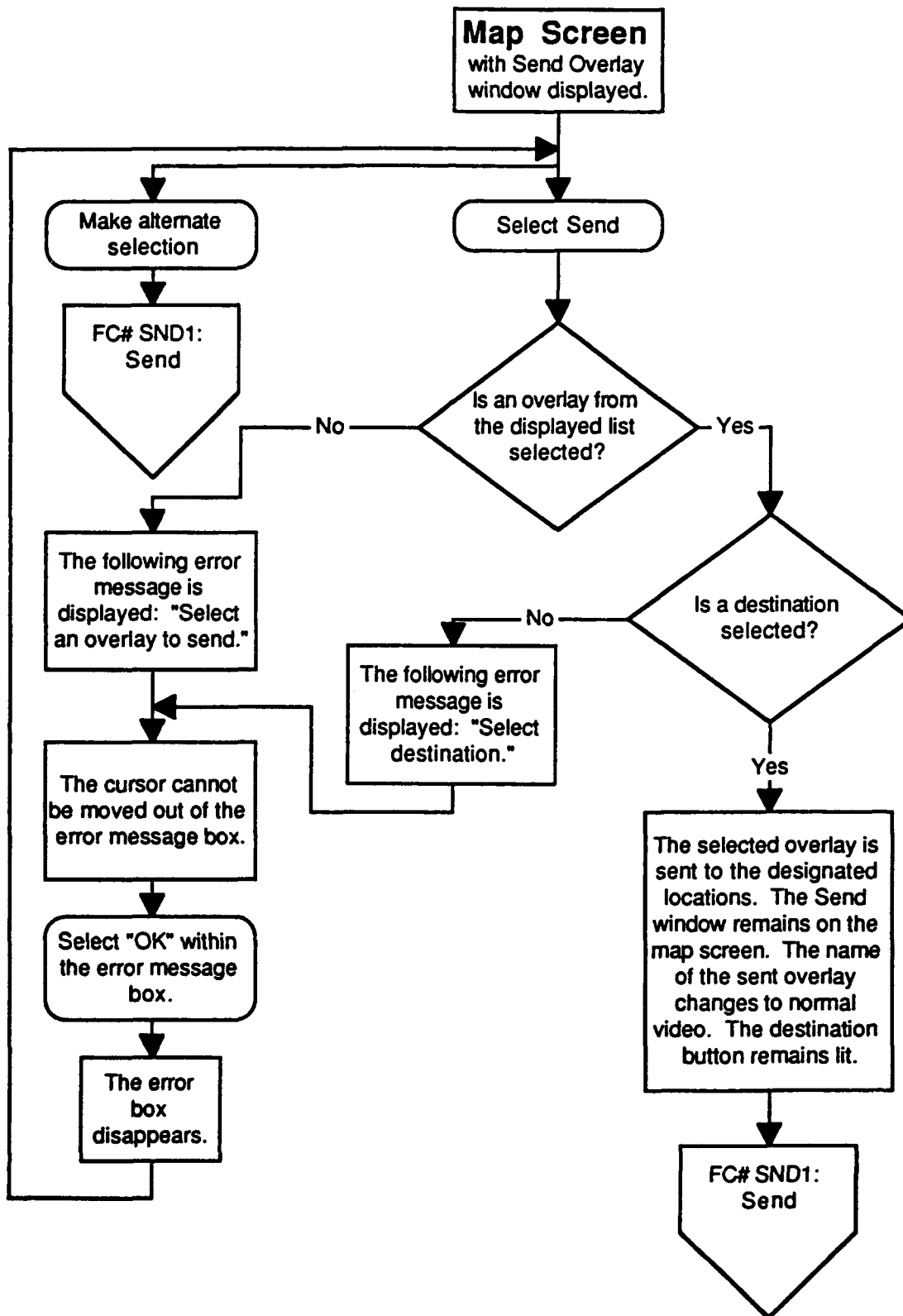


Figure A-43. Send Overlay (cont.) (FC# SND2)

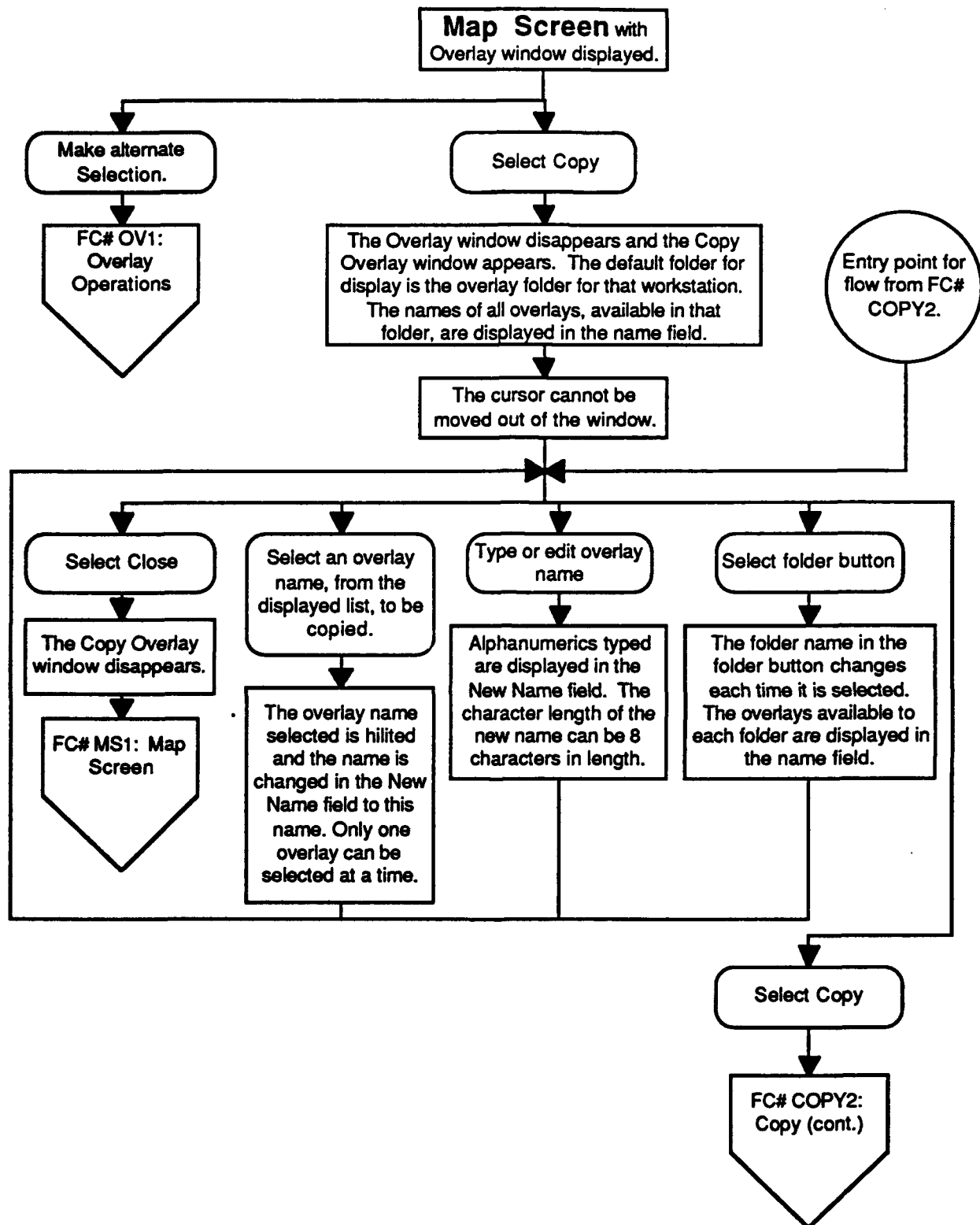


Figure A-44. Copy Overlay (FC# COPY1)

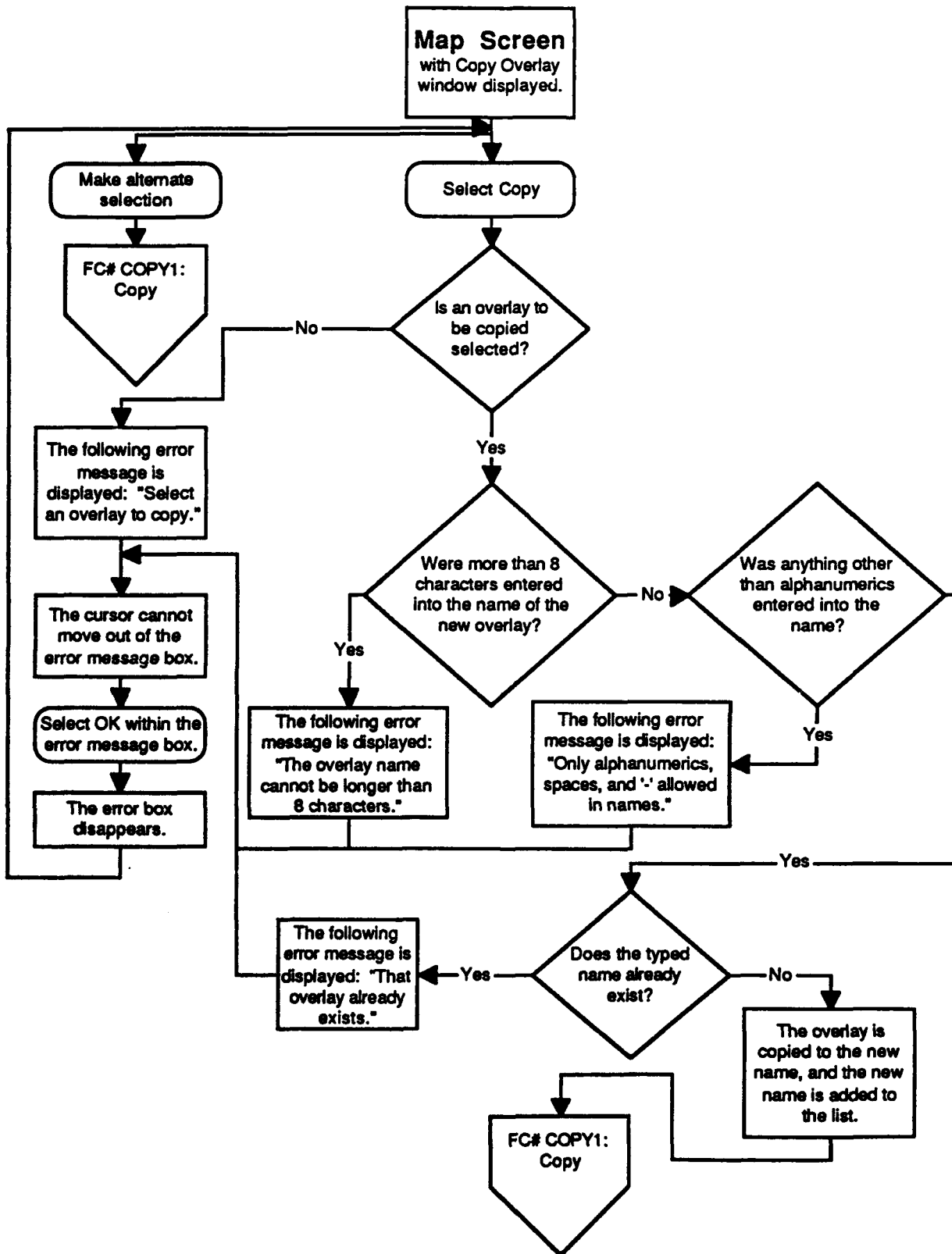


Figure A-45. Copy Overlay (cont.) (FC# COPY2)

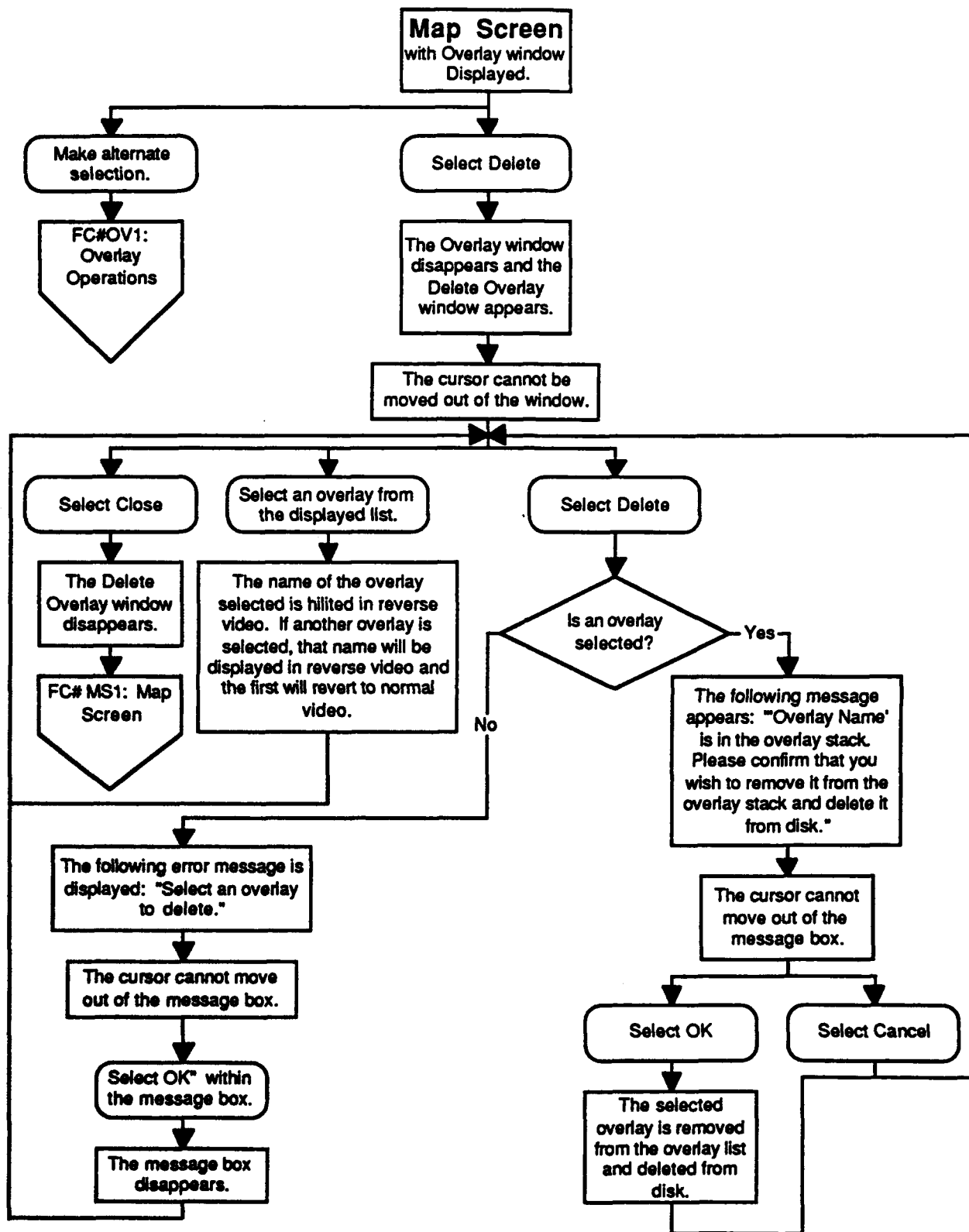
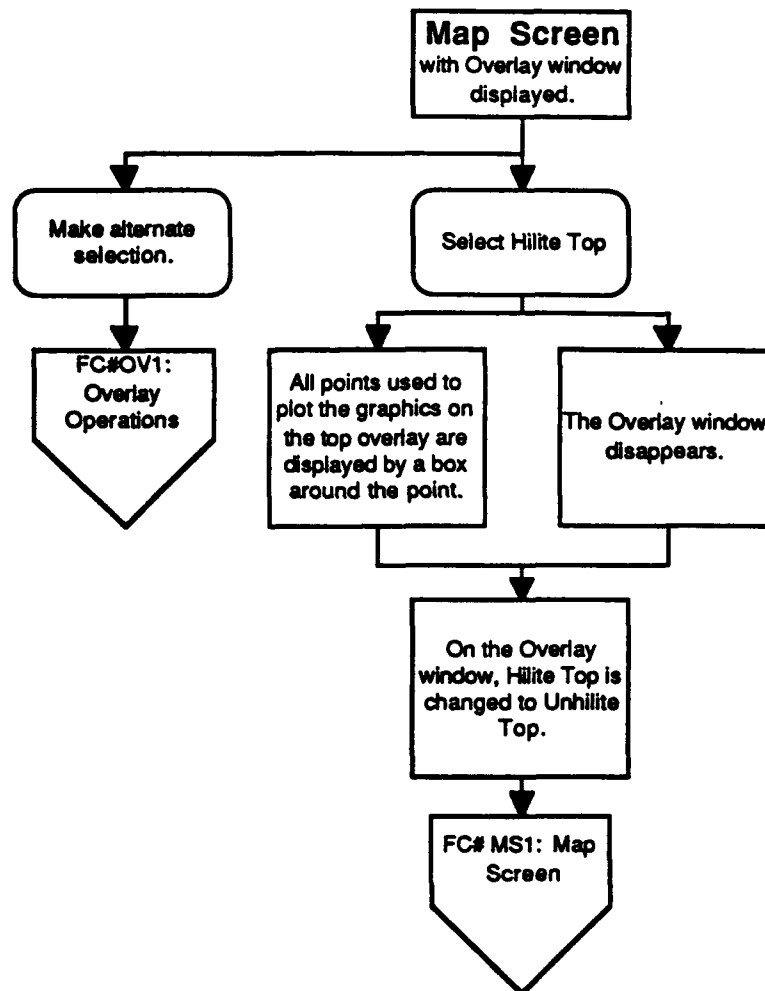


Figure A-46. Delete Overlay (FC# DLT1)



The Hilite Top function also toggles to the Unhilite Top function when it is selected and vice versa. The Unhilite function works just the opposite of the Hilite function. When used, the Unhilite function removes the boxes from the top overlay. Also, the Unhilite Top function on the Overlay window is changed to Hilite Top.

Figure A-47. Hilite Top (FC# HT1)

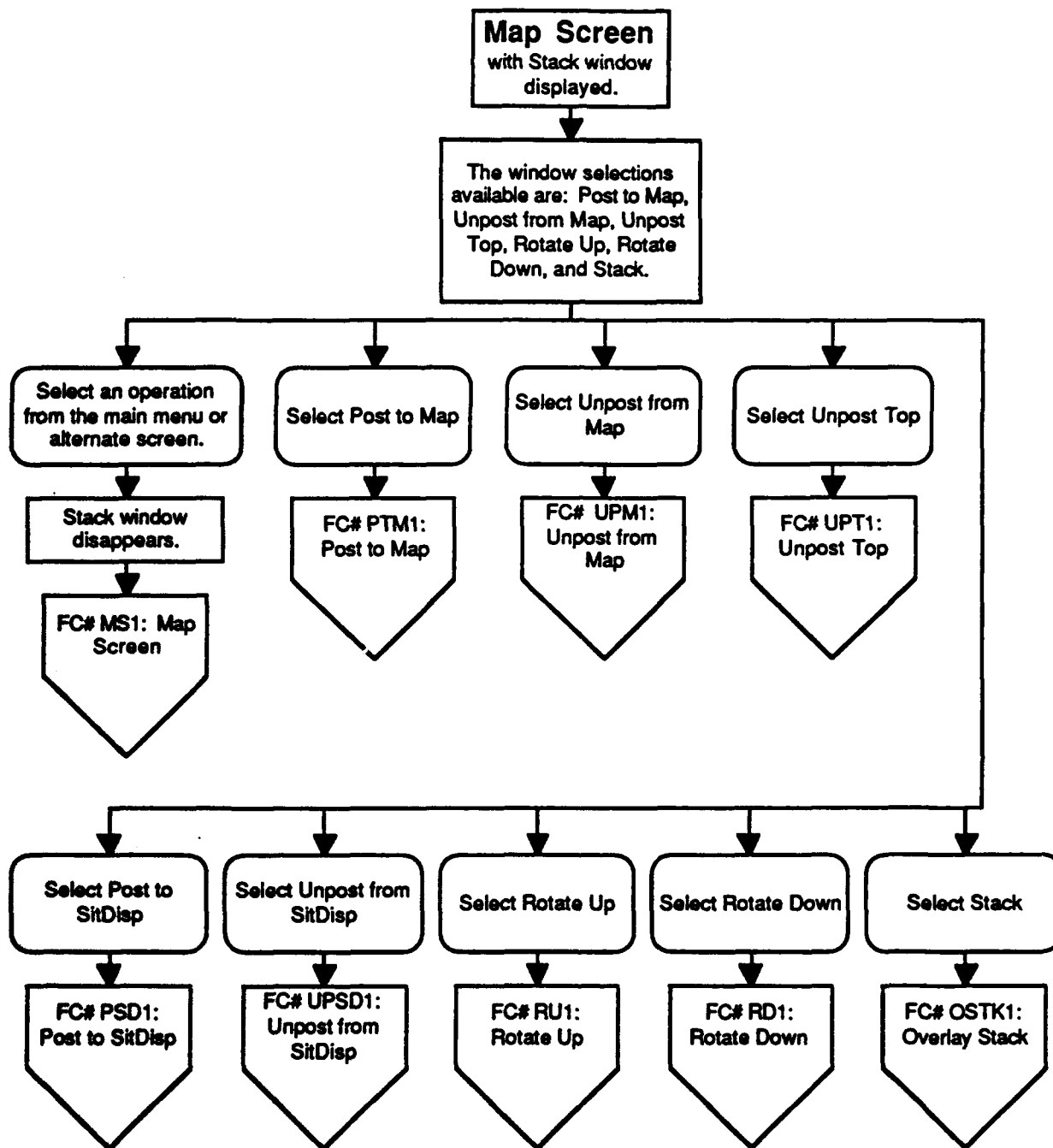


Figure A-48 Stacking (FC# SKT1)

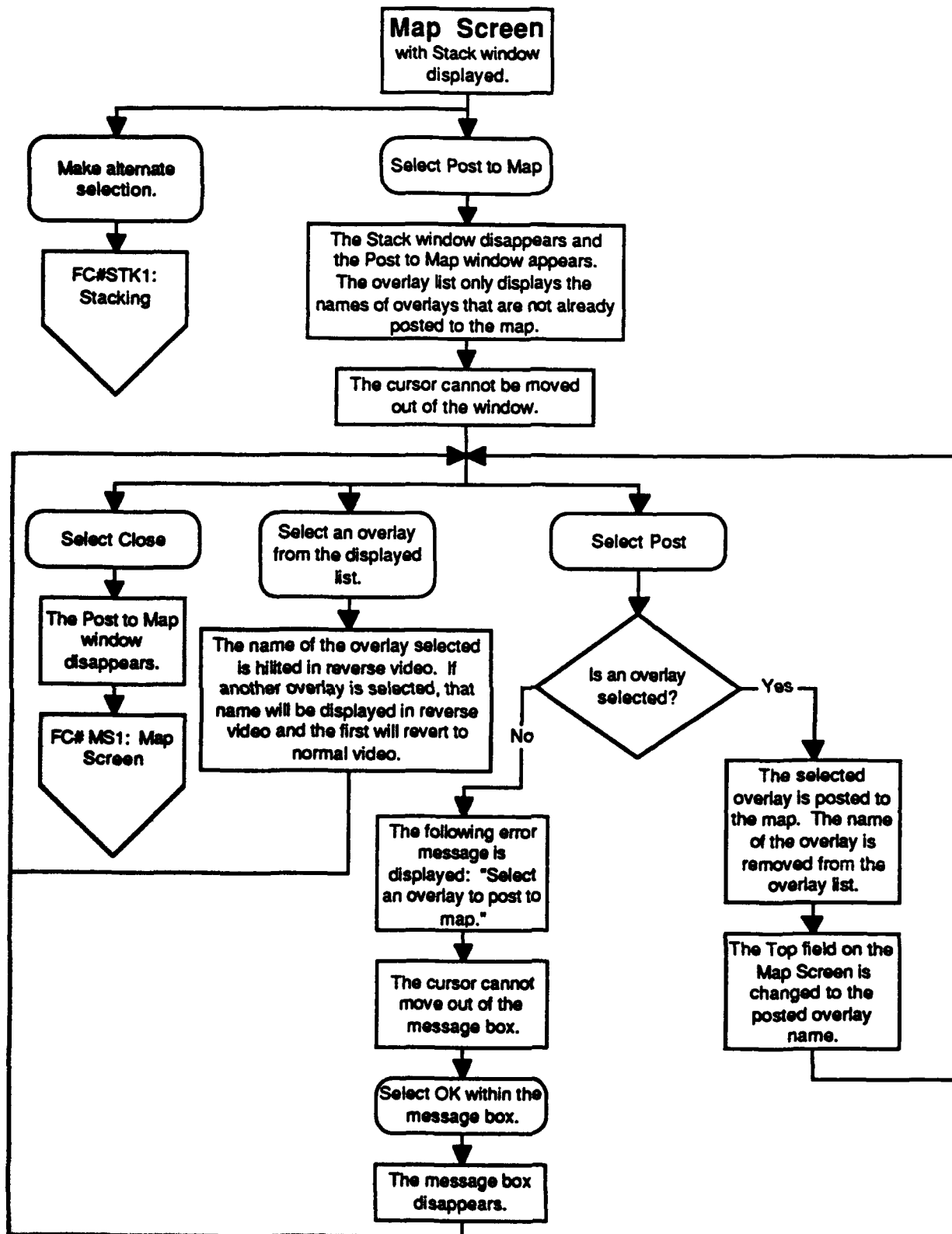


Figure A-49. Post to Map (FC# PTM1)

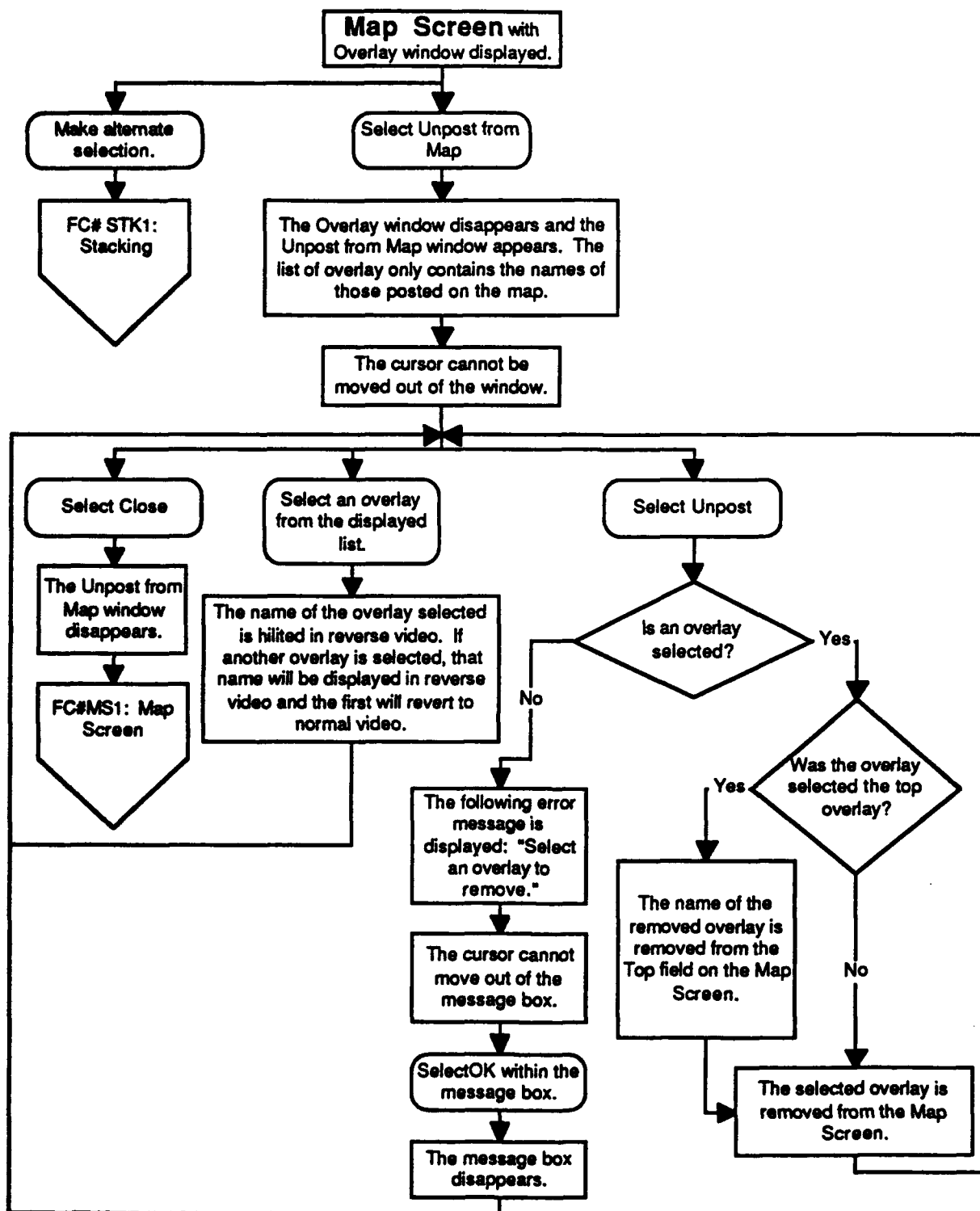


Figure A-50. Unpost from Map (FC# UPM1)

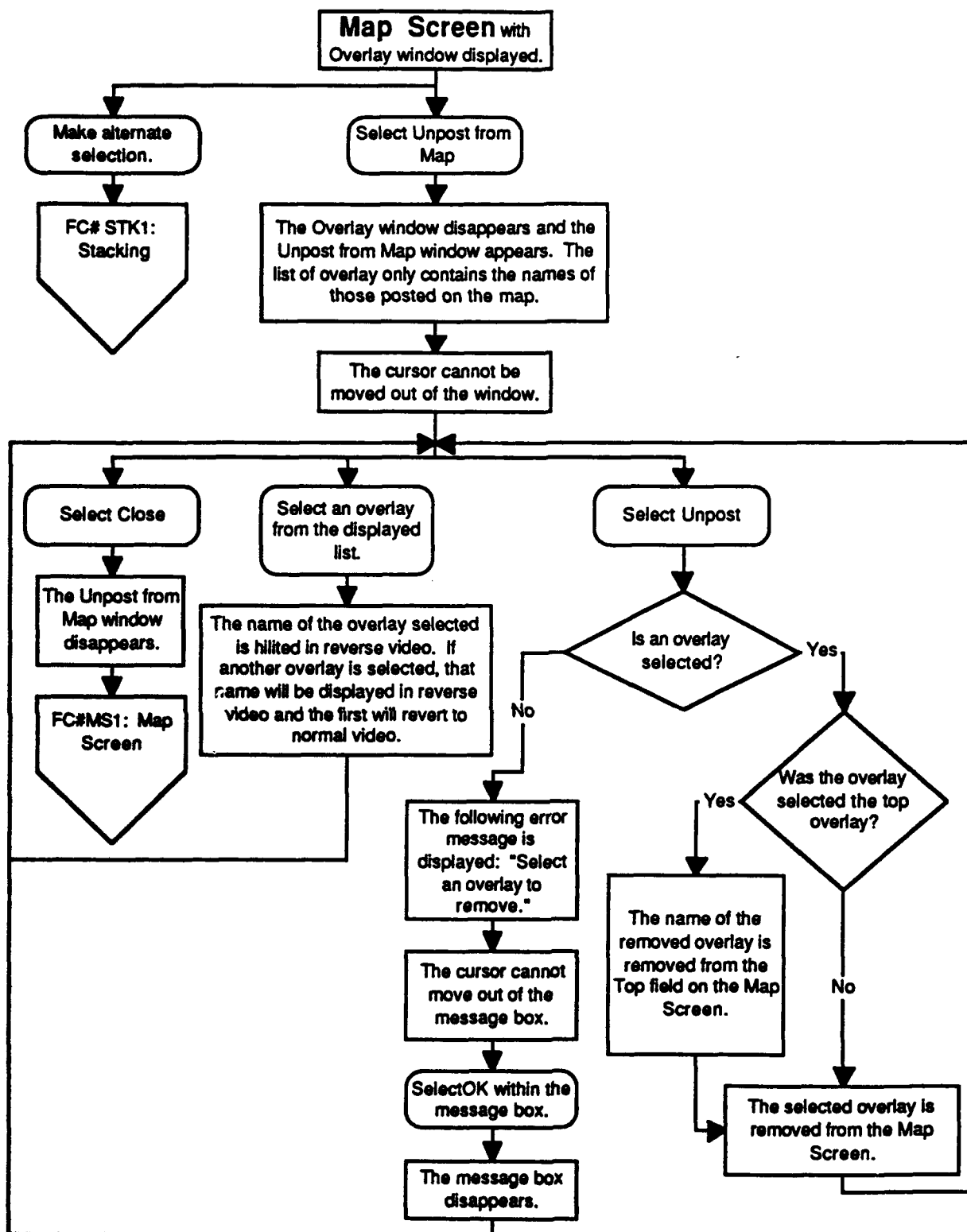


Figure A-51. Unpost Top (FC# UPT1)

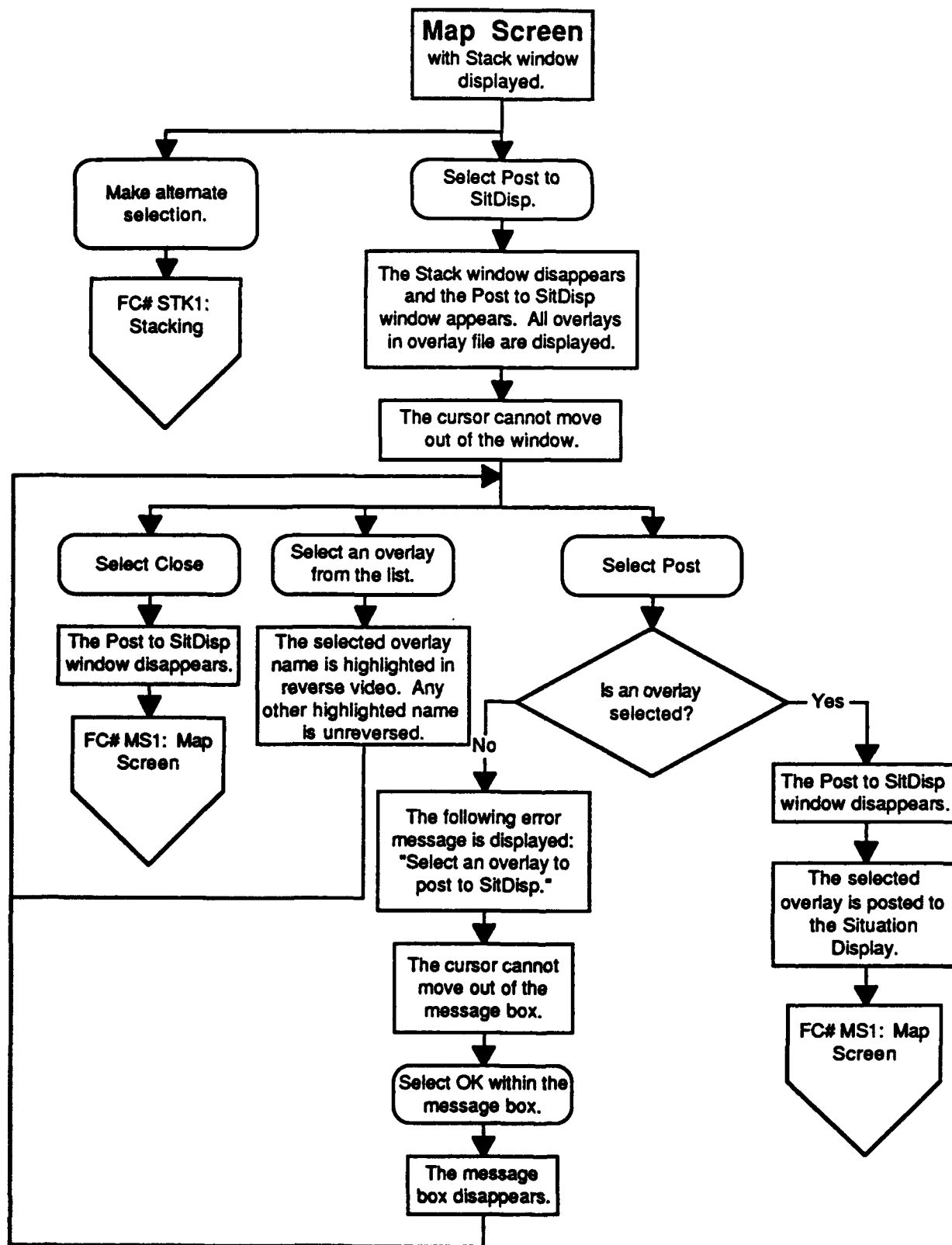


Figure A-52. Post to SitDisp (FC# PSD1)

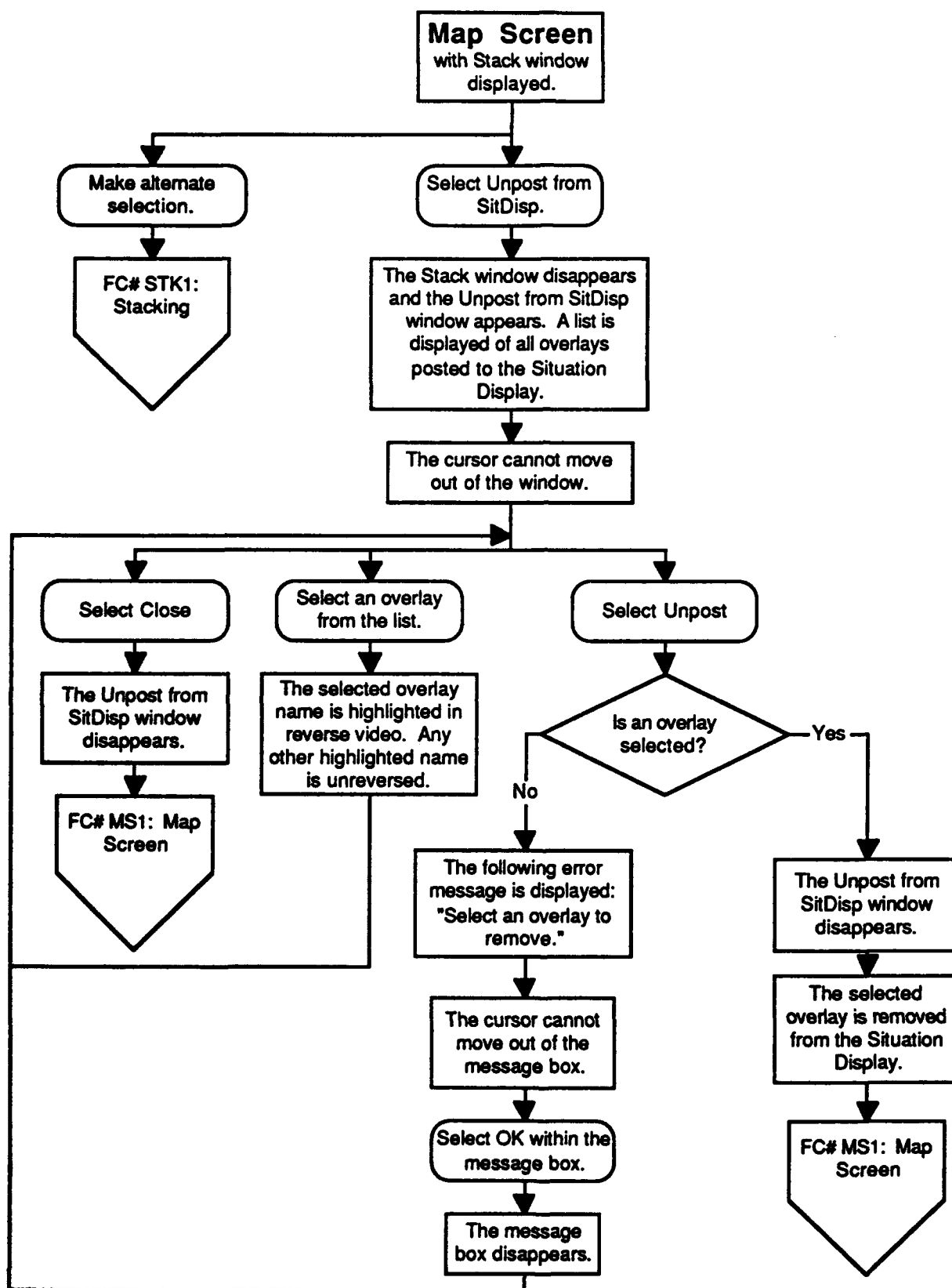


Figure A-53. Unpost from SitDisp (FC# UPSD1)

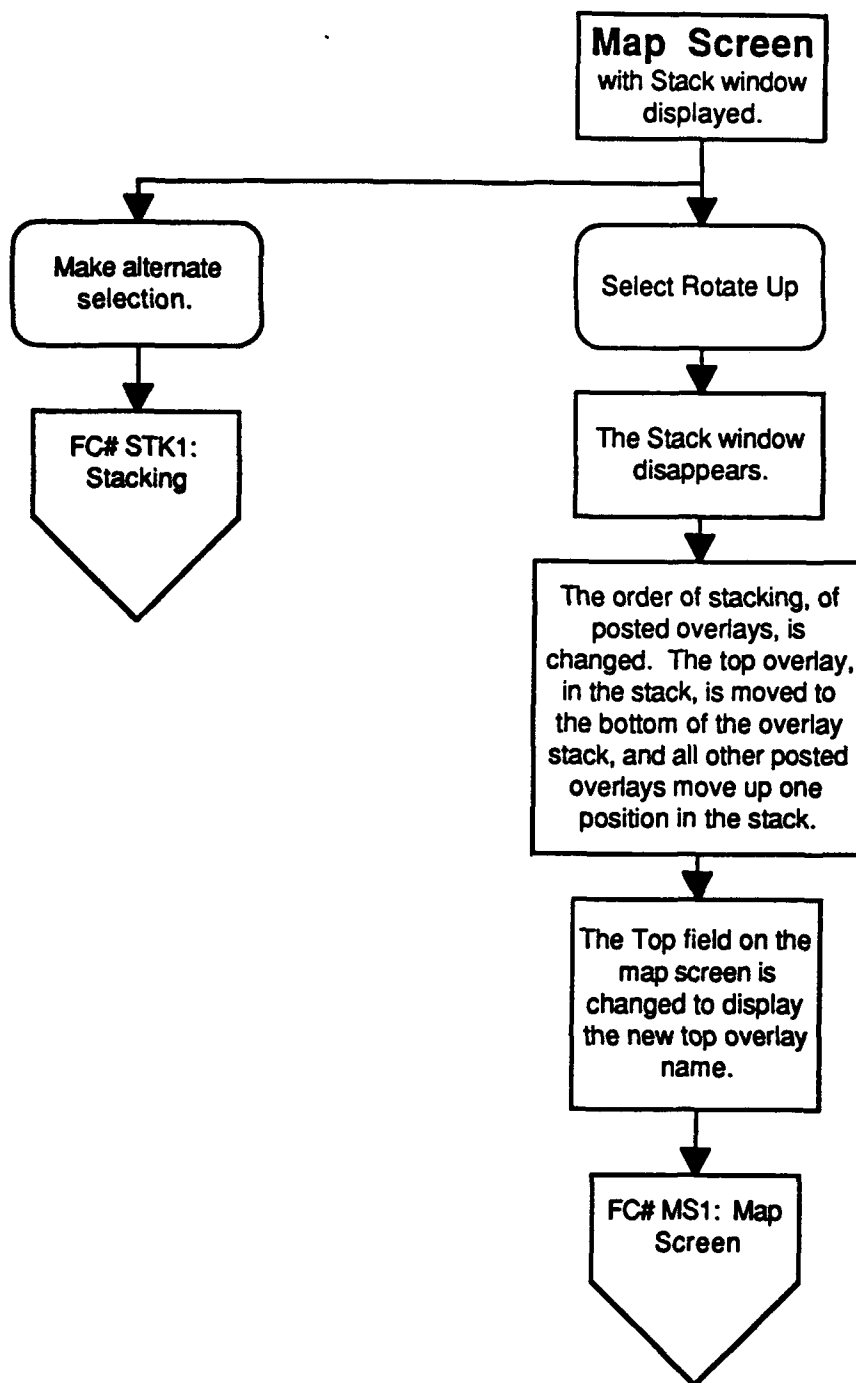


Figure A-54. Rotate Up (FC# RU1)

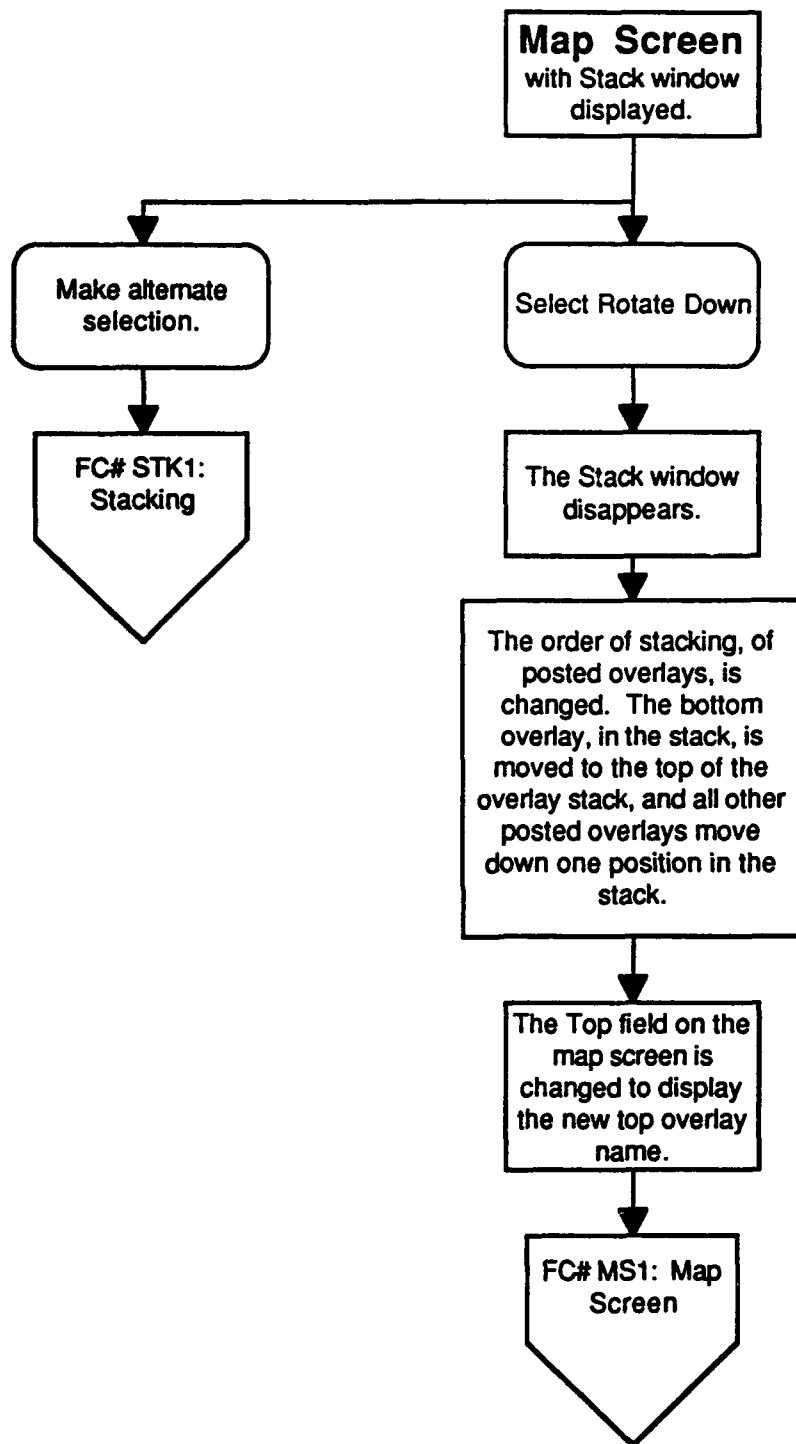


Figure A-55. Rotate Down (FC# RD1)

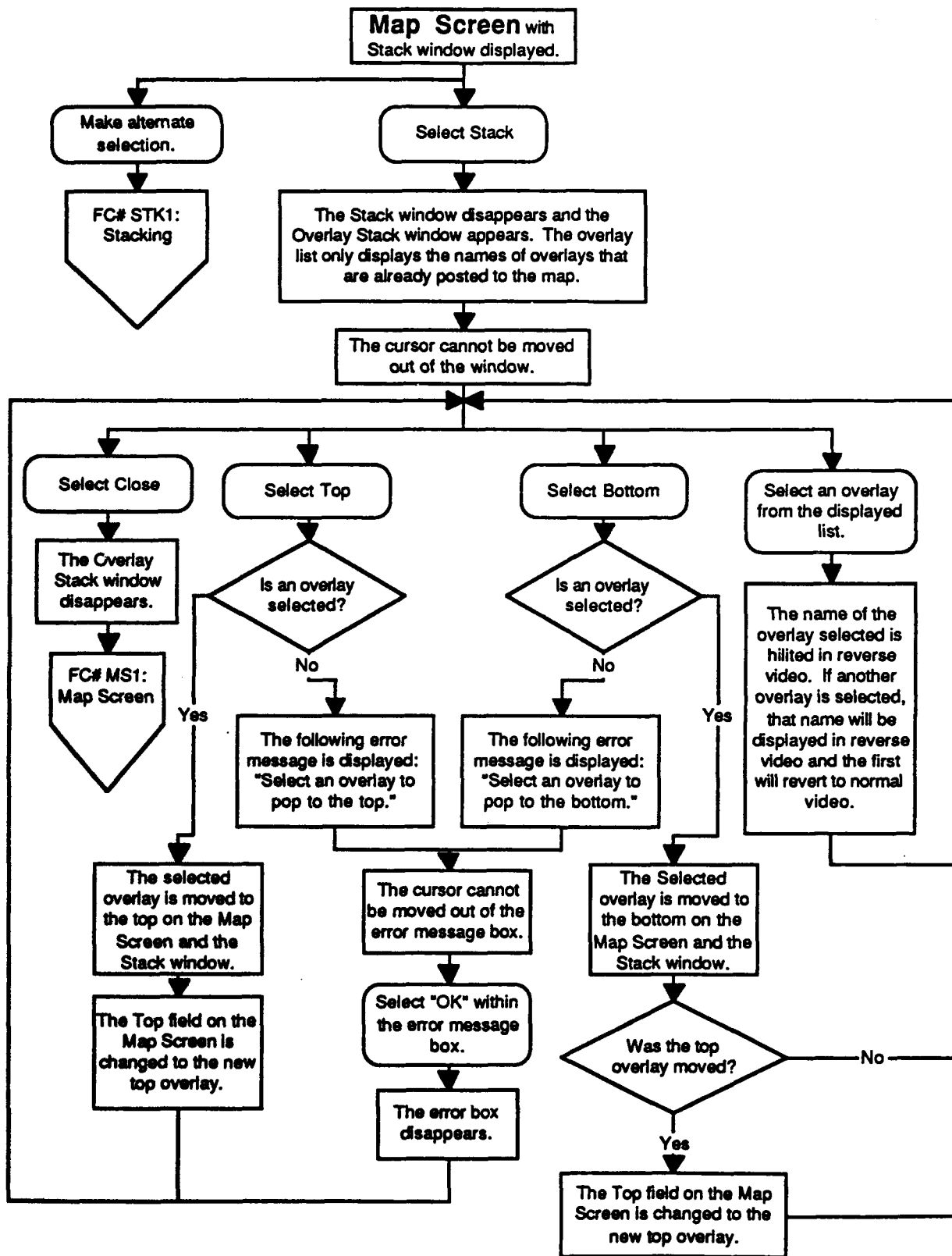
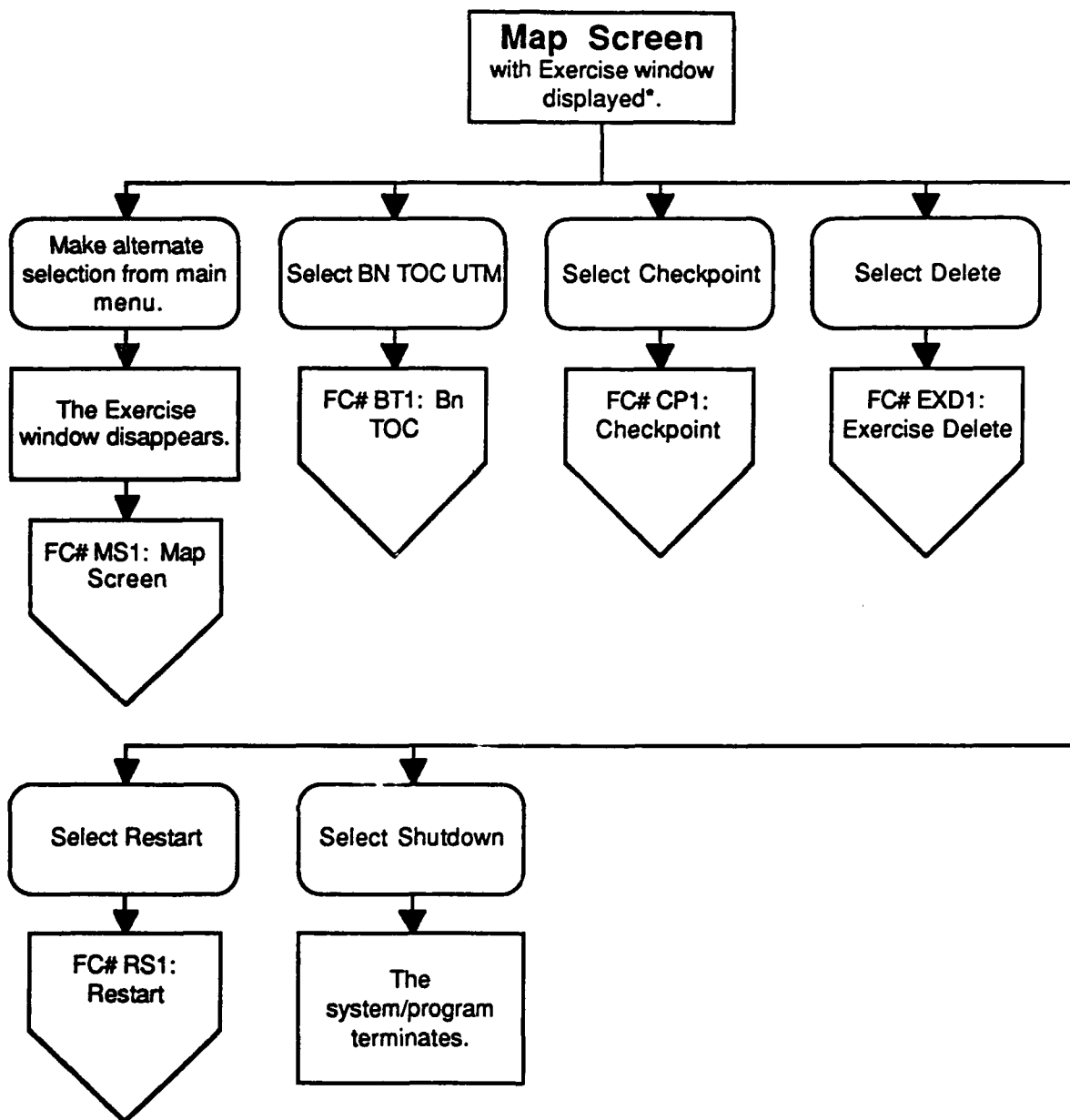


Figure A-56. Overlay Stack (FC# OSTK1)



*This option is only available on the workstation designated as the coordinator.

Figure A-57. Exercise Operations (FC# EX1)

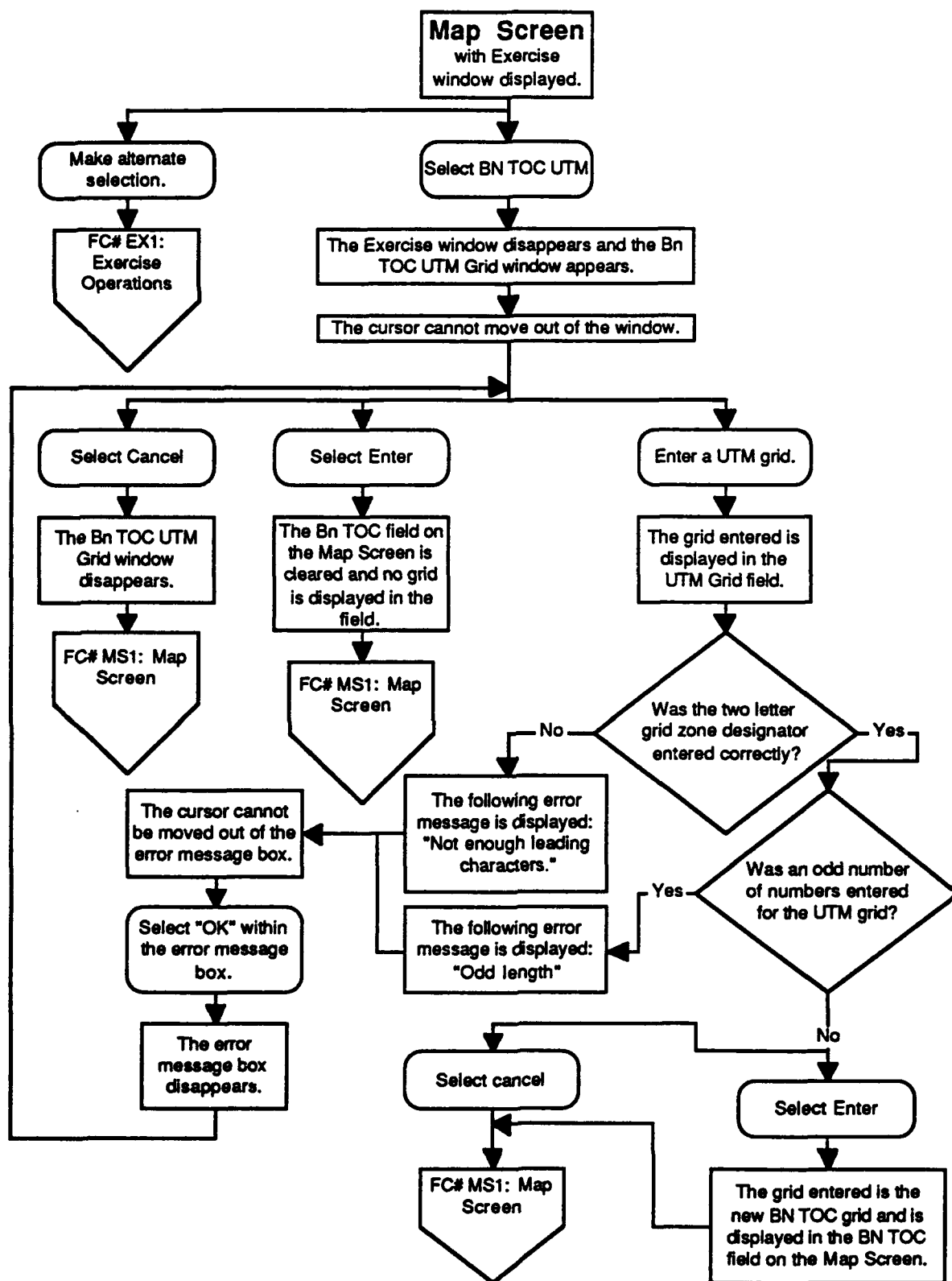


Figure A-58. BN TOC UTM (FC# BT1)

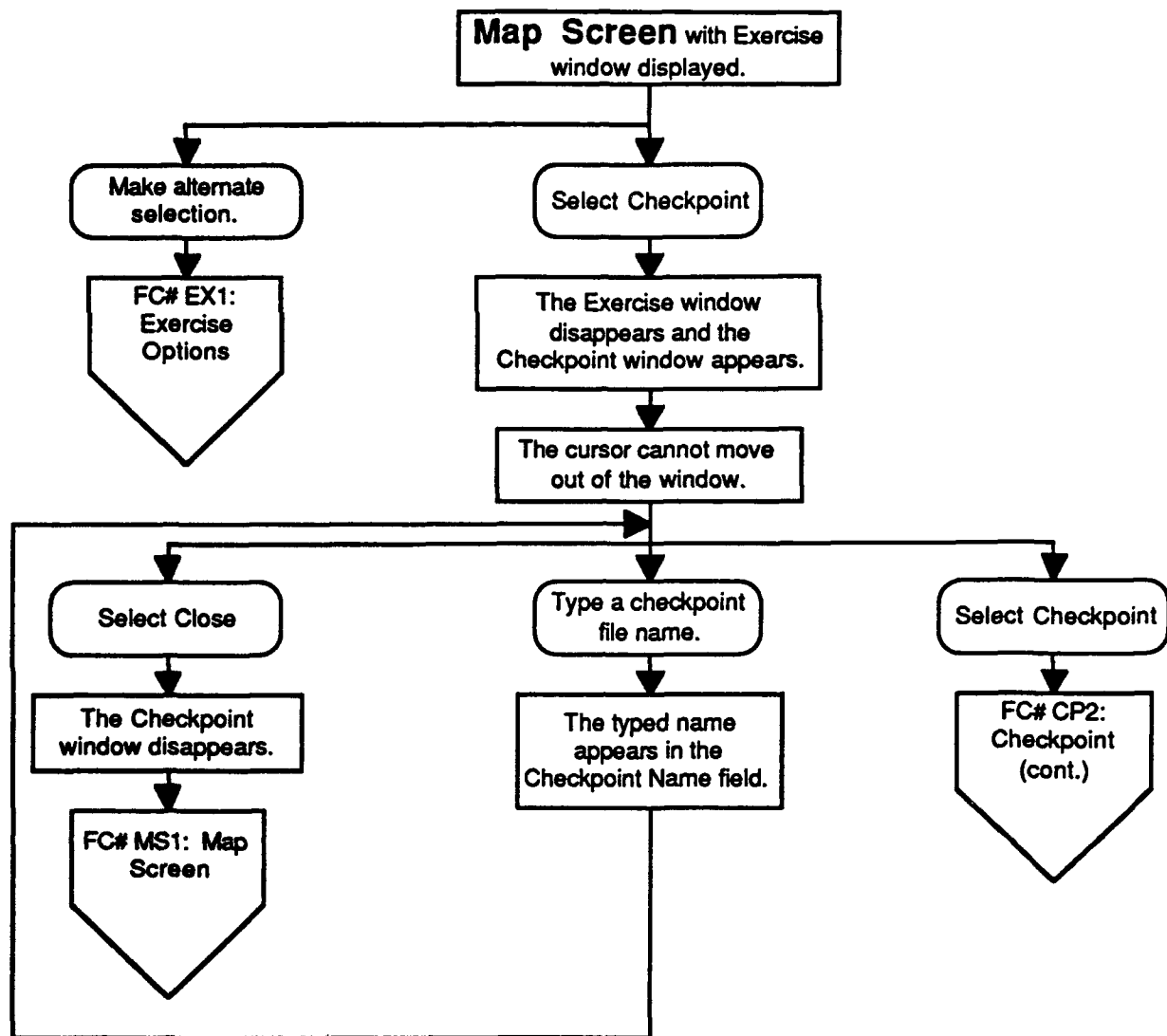


Figure A-59. Checkpoint (FC# CP1)

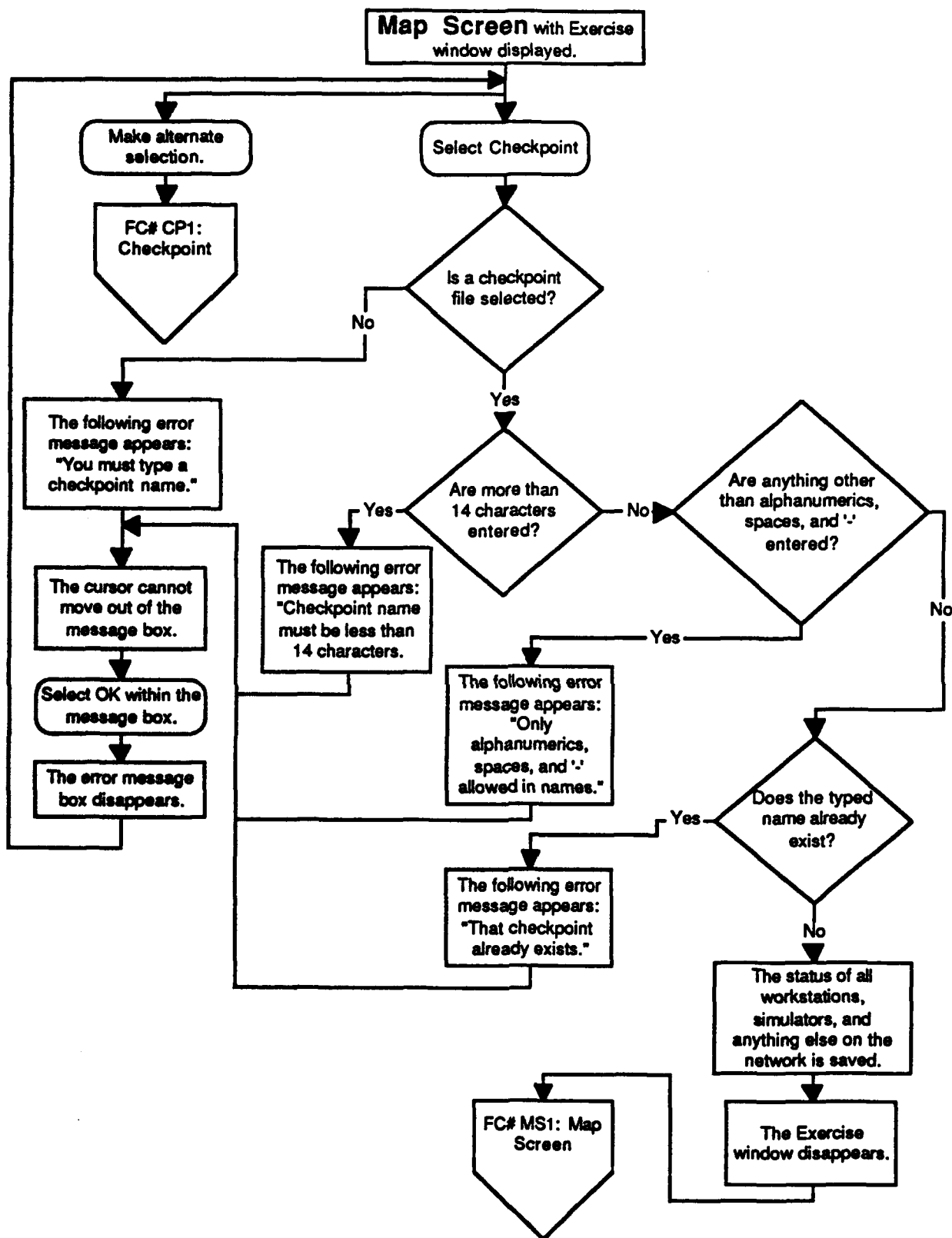


Figure A-60. Checkpoint (cont.) (FC# CP2)

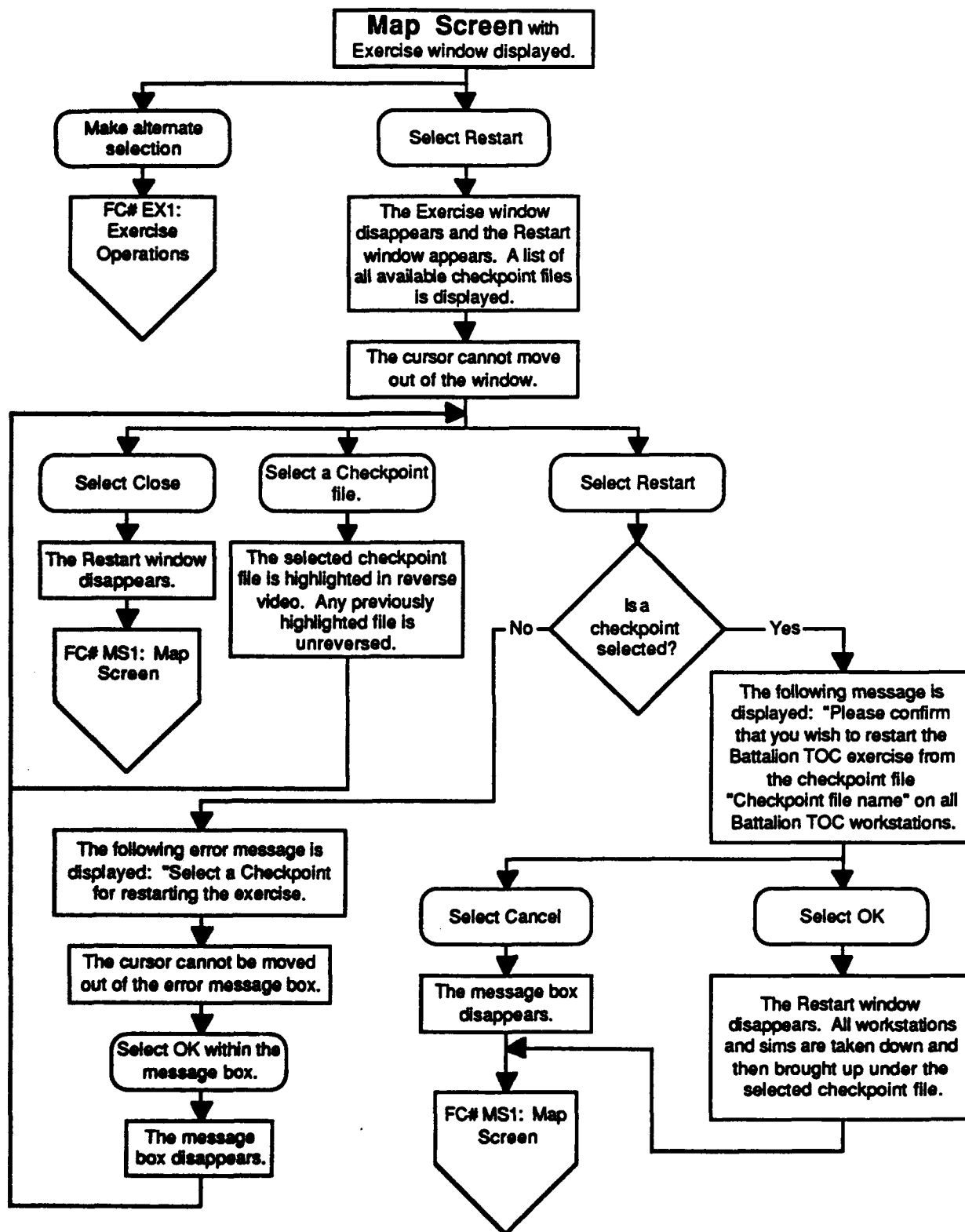


Figure A-61. Restart (FC# RS1)

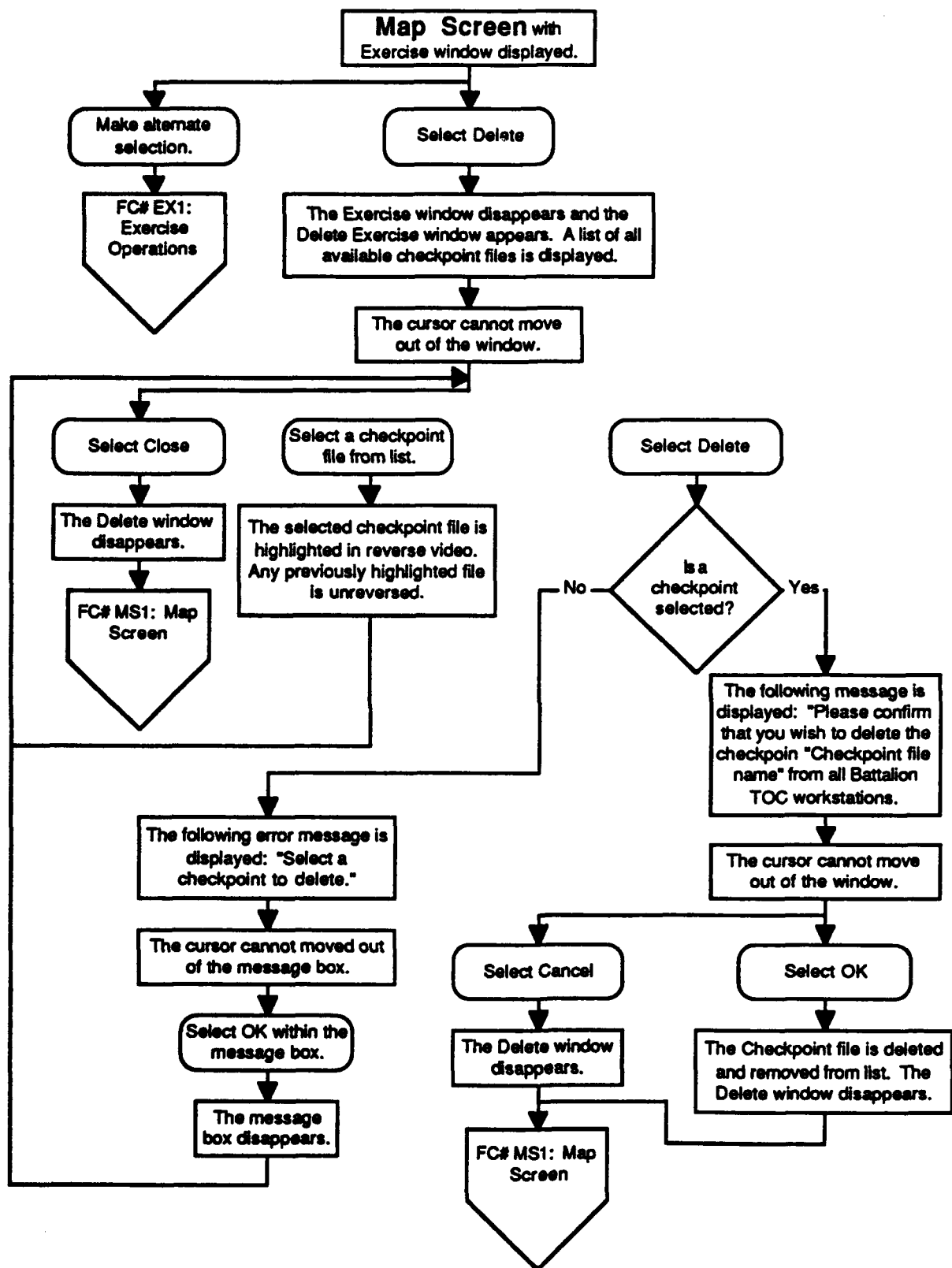


Figure A-62. Exercise Delete (FC# EXD1)

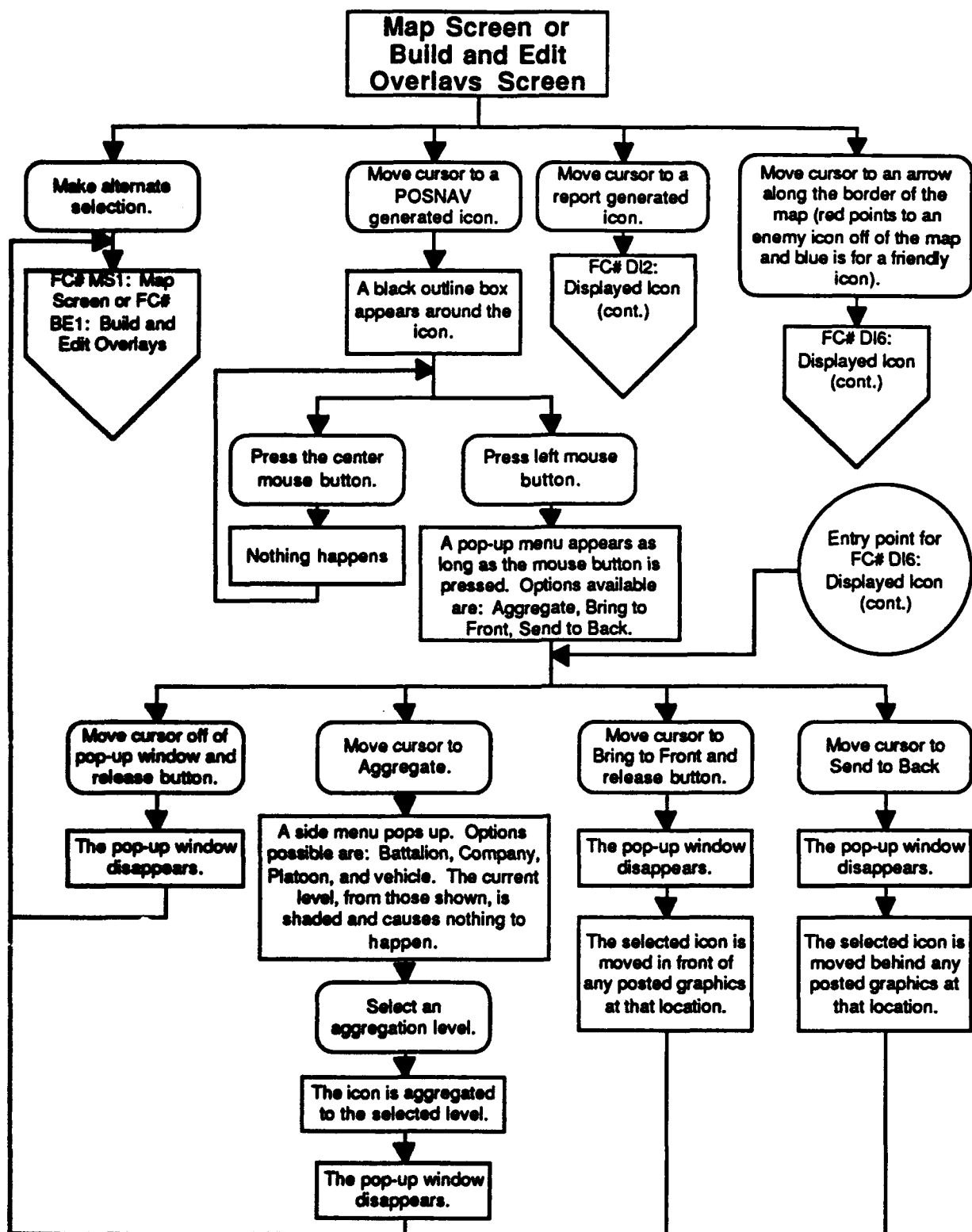


Figure A-63. Displayed Icon (FC# DI1)

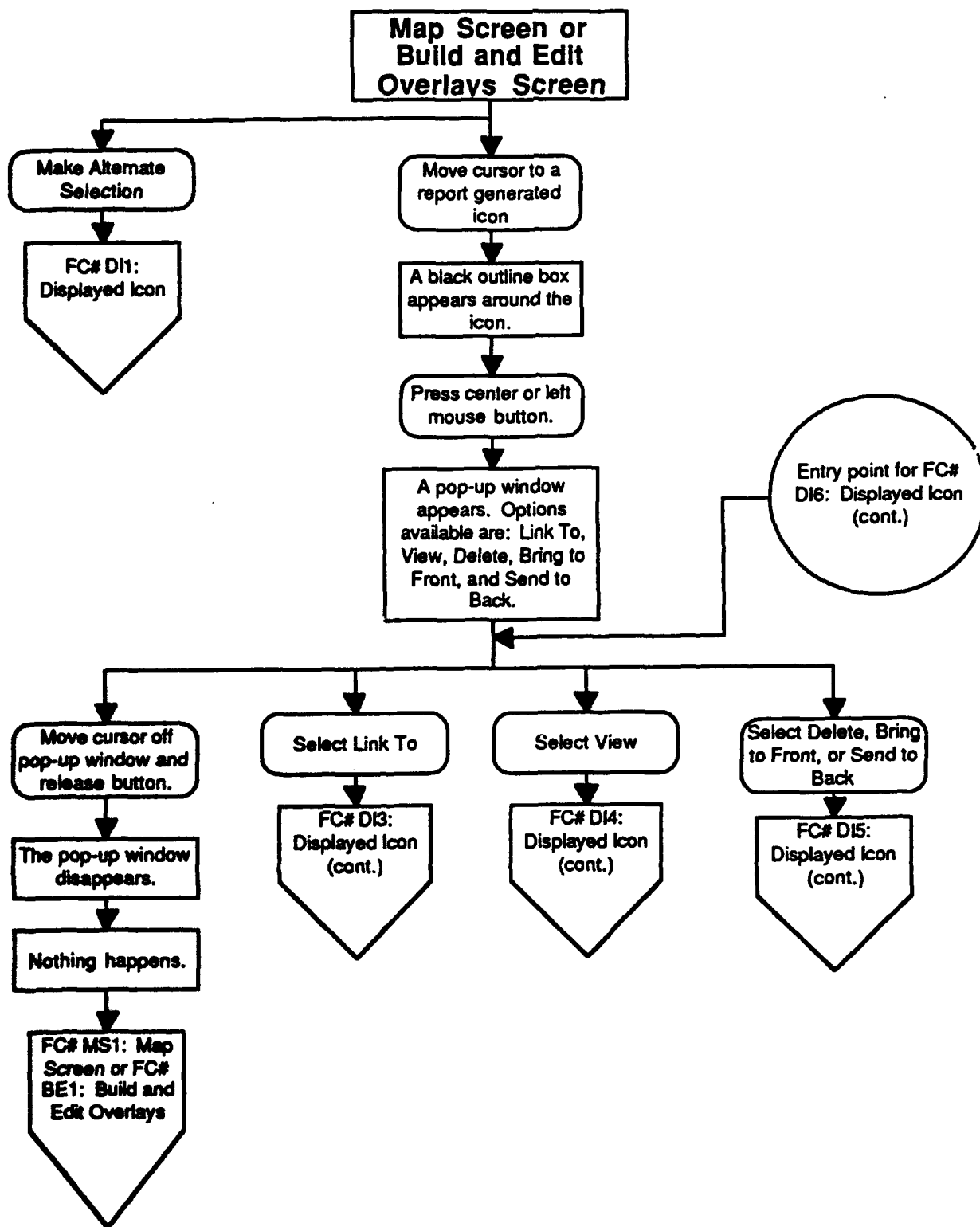


Figure A-64. Displayed Icon (cont.) (FC# DI2)

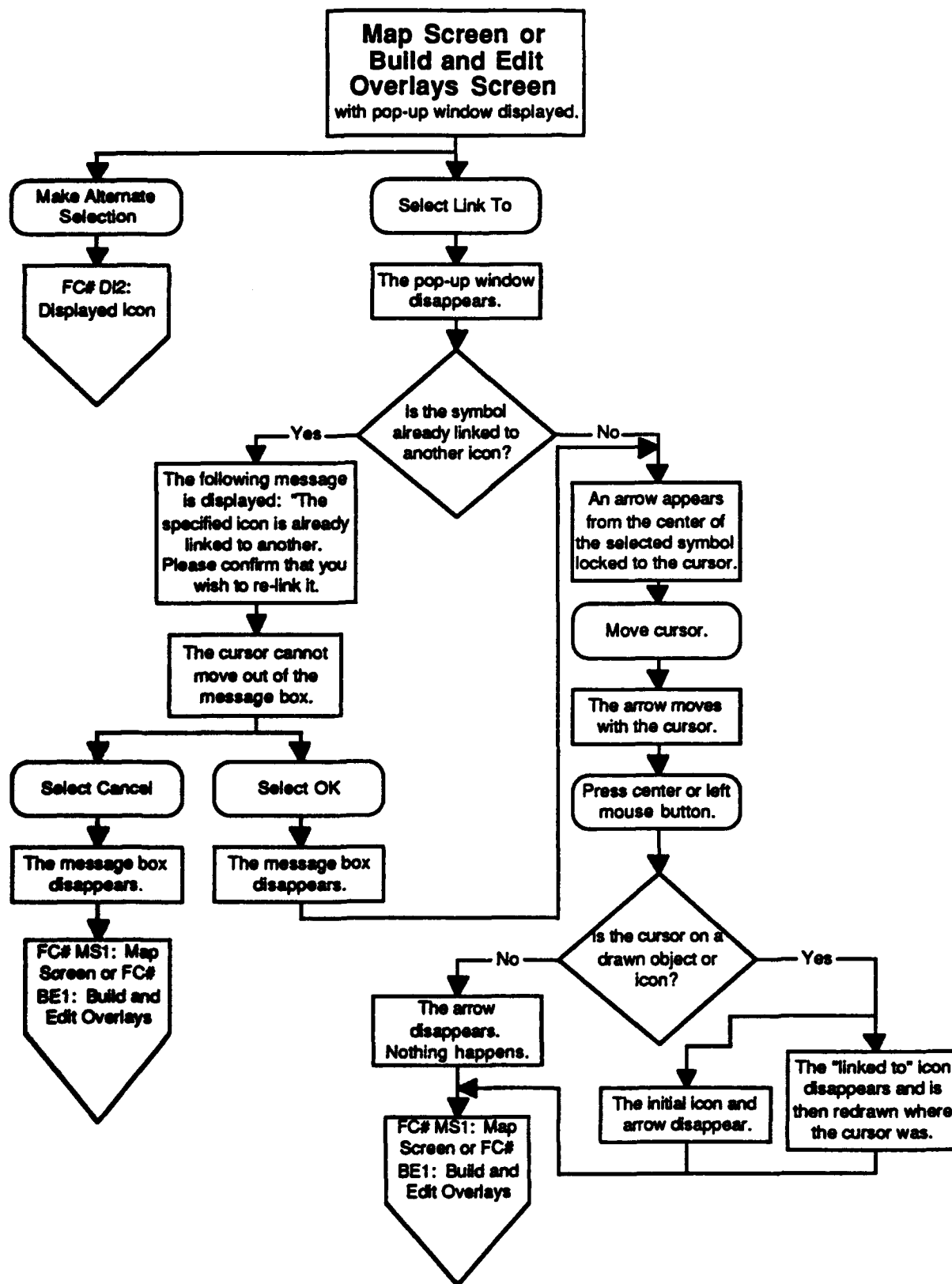


Figure A-65. Displayed Icon (cont.) (FC# DI3)

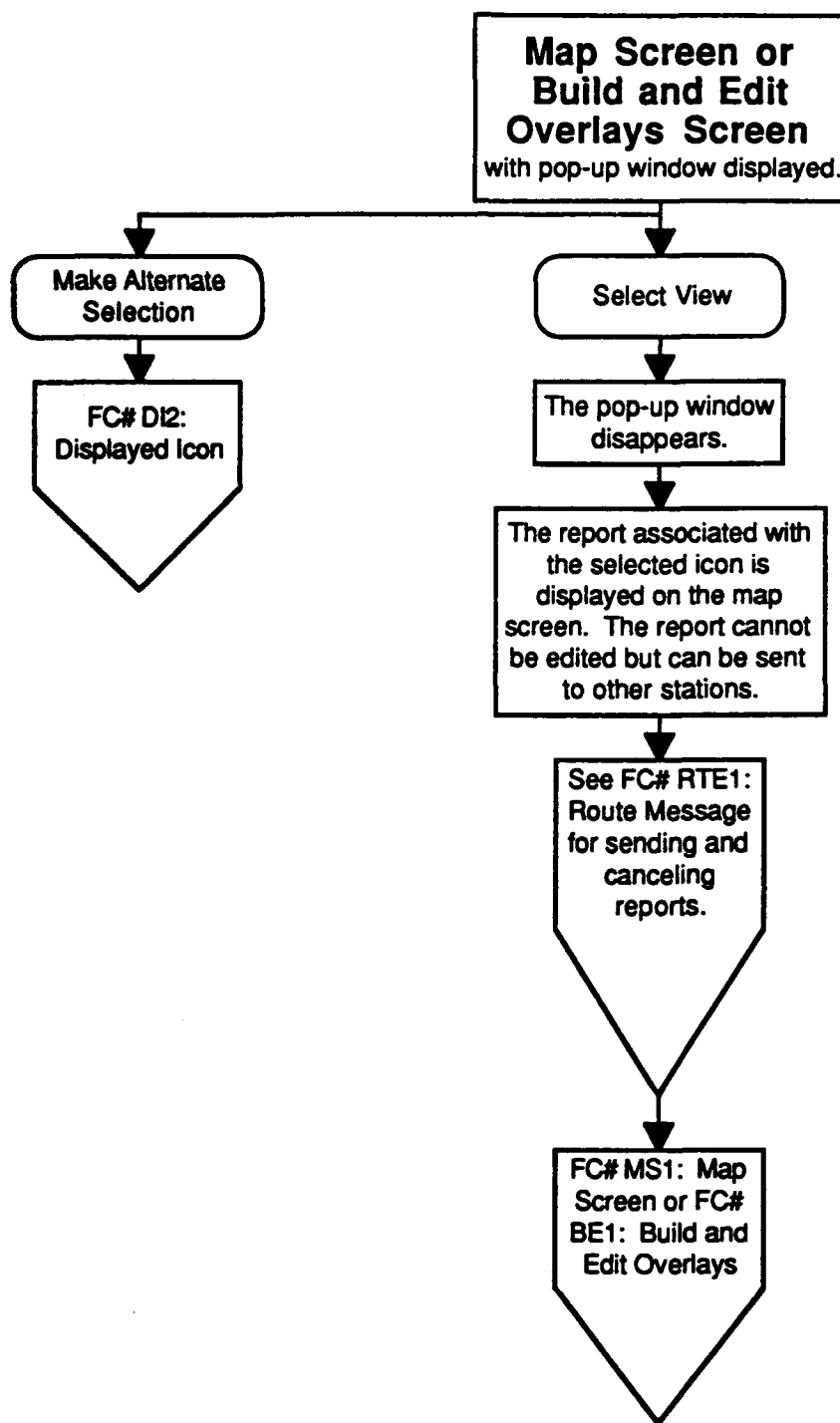


Figure A-66. Displayed Icon (cont.) (FC# DI4)

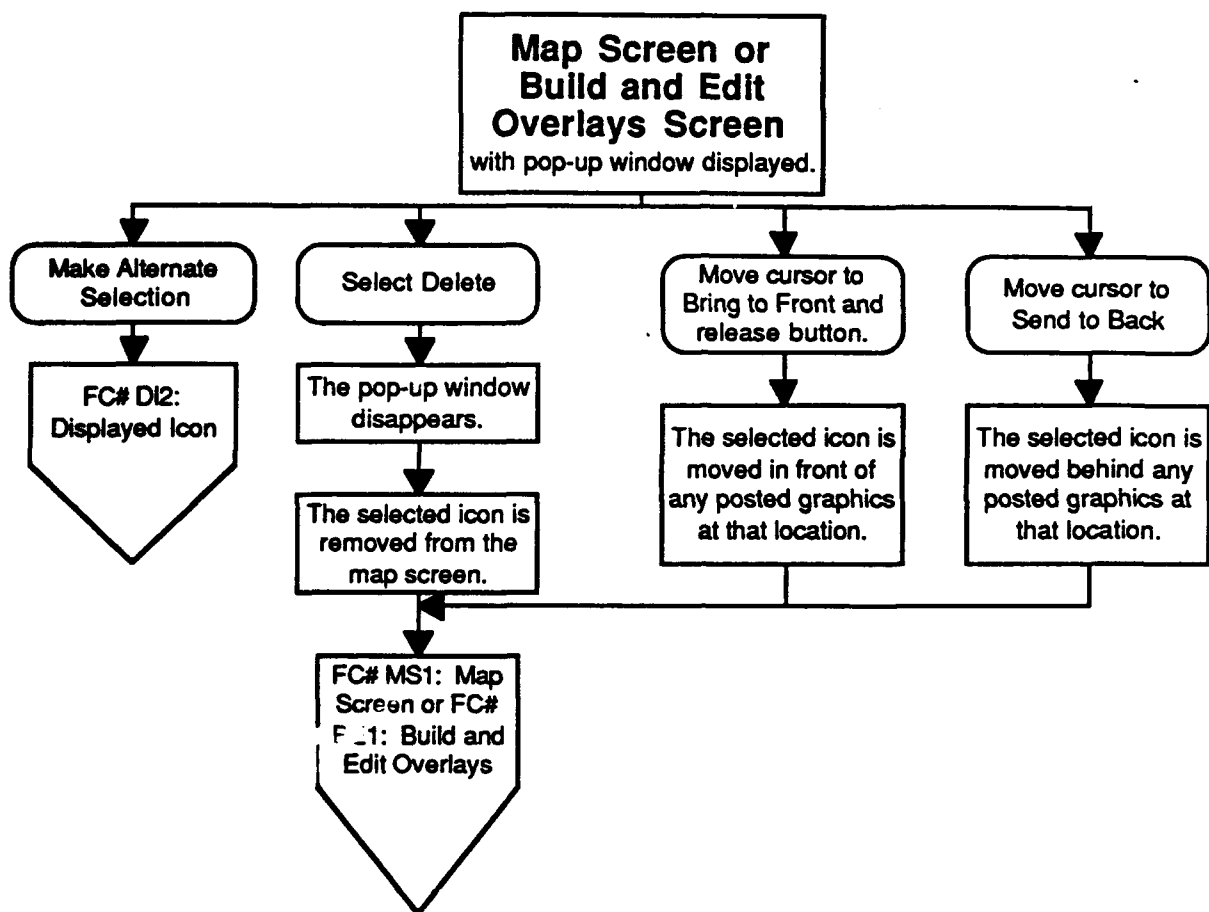


Figure A-67. Displayed Icon (cont.) (FC# DI5)

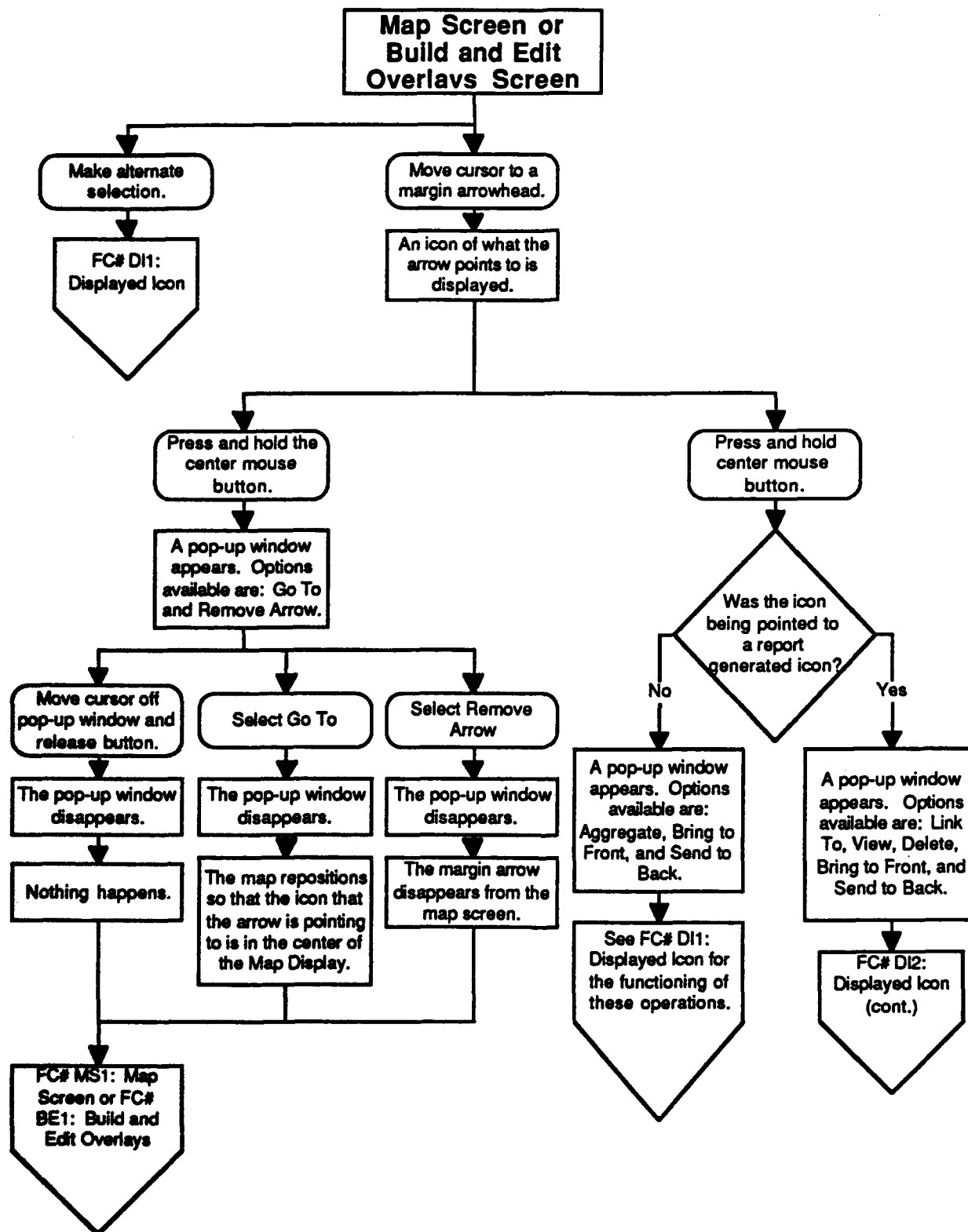
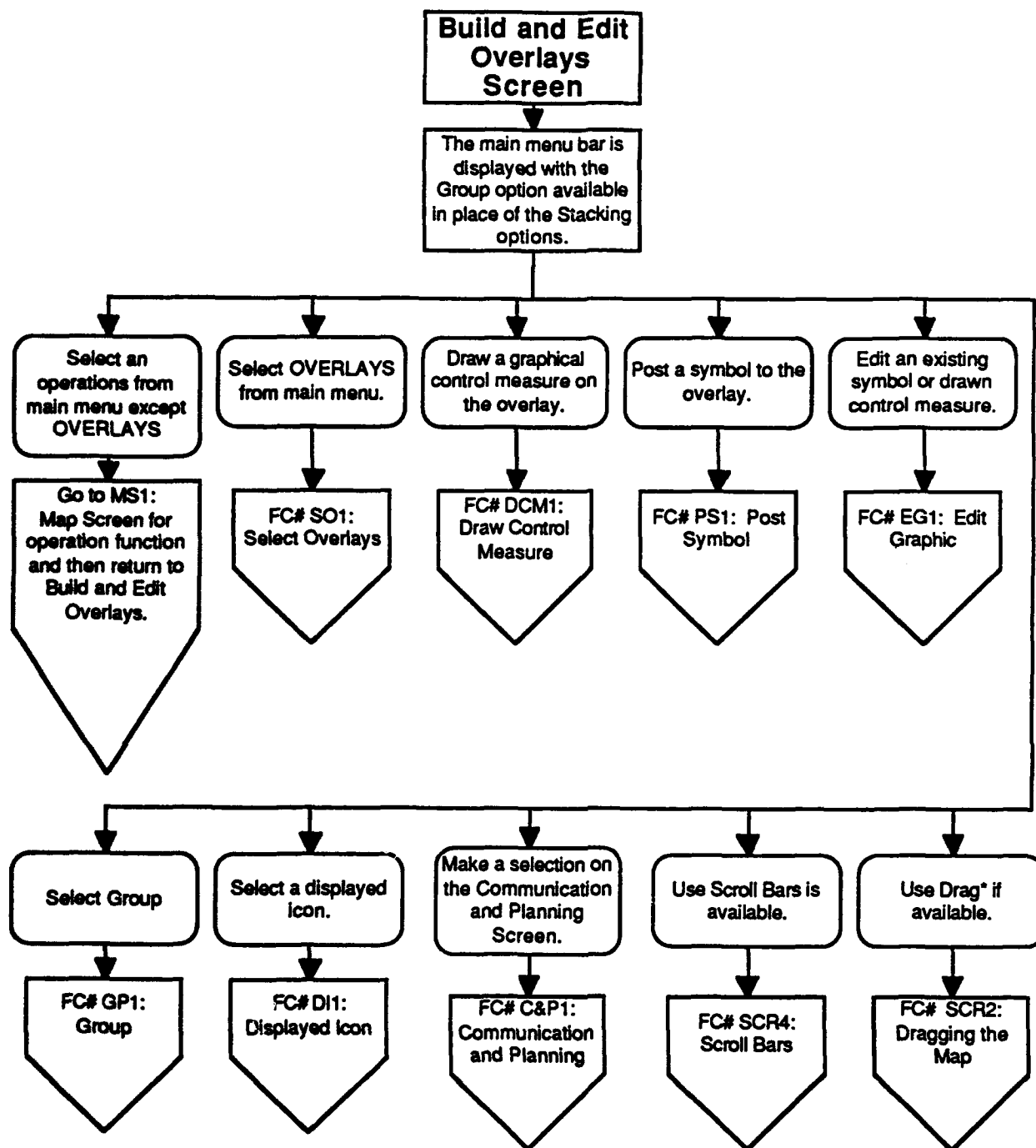


Figure A-68. Displayed Icon (cont.) (FC# DI6)



*Only symbols can be drawn when the drag is enabled. No figures can be drawn or edited.

Figure A-69. Build and Edit Overlays Screen (FC# BE1)

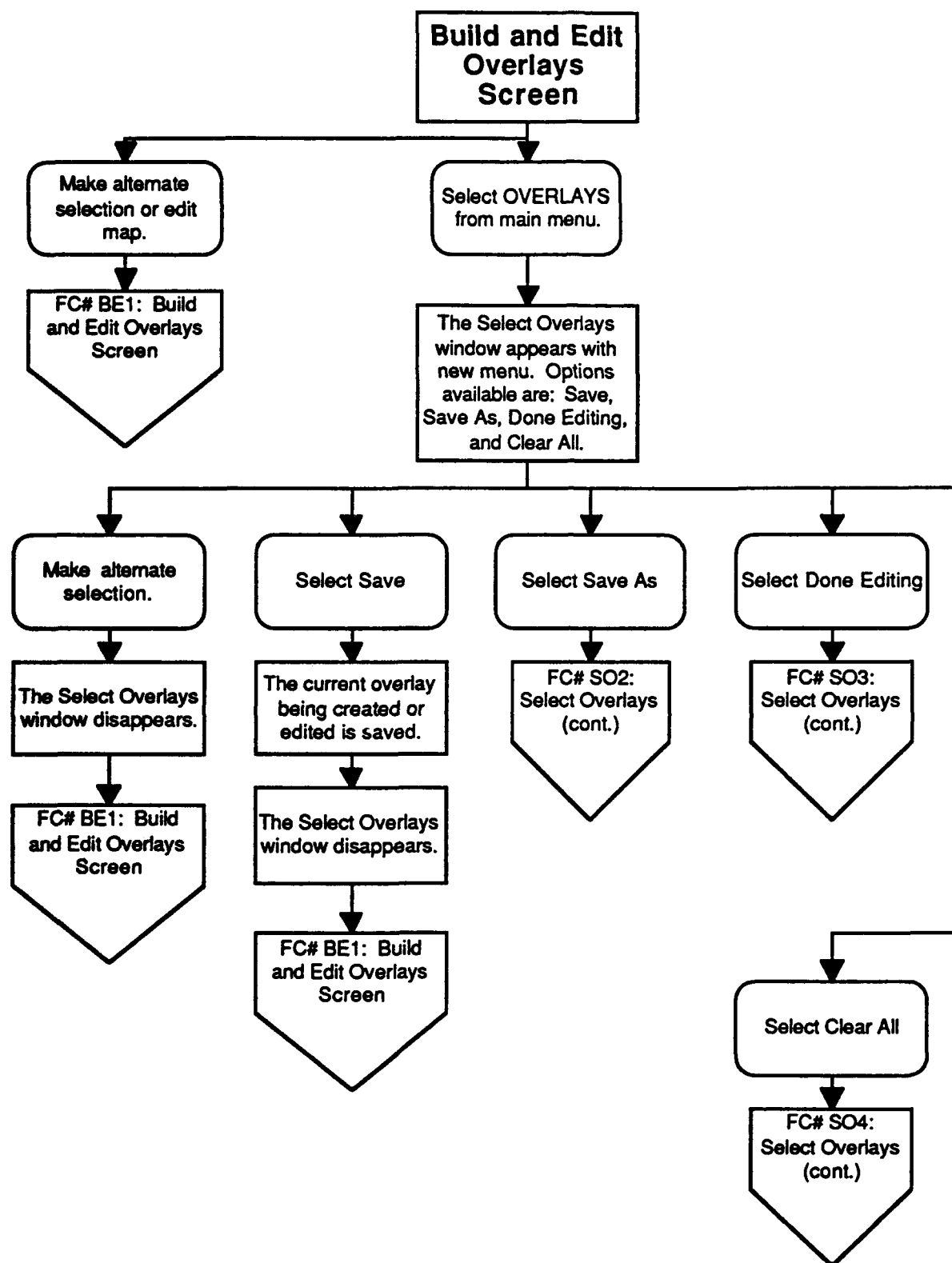


Figure A-70. Select Overlays (FC# SO1)

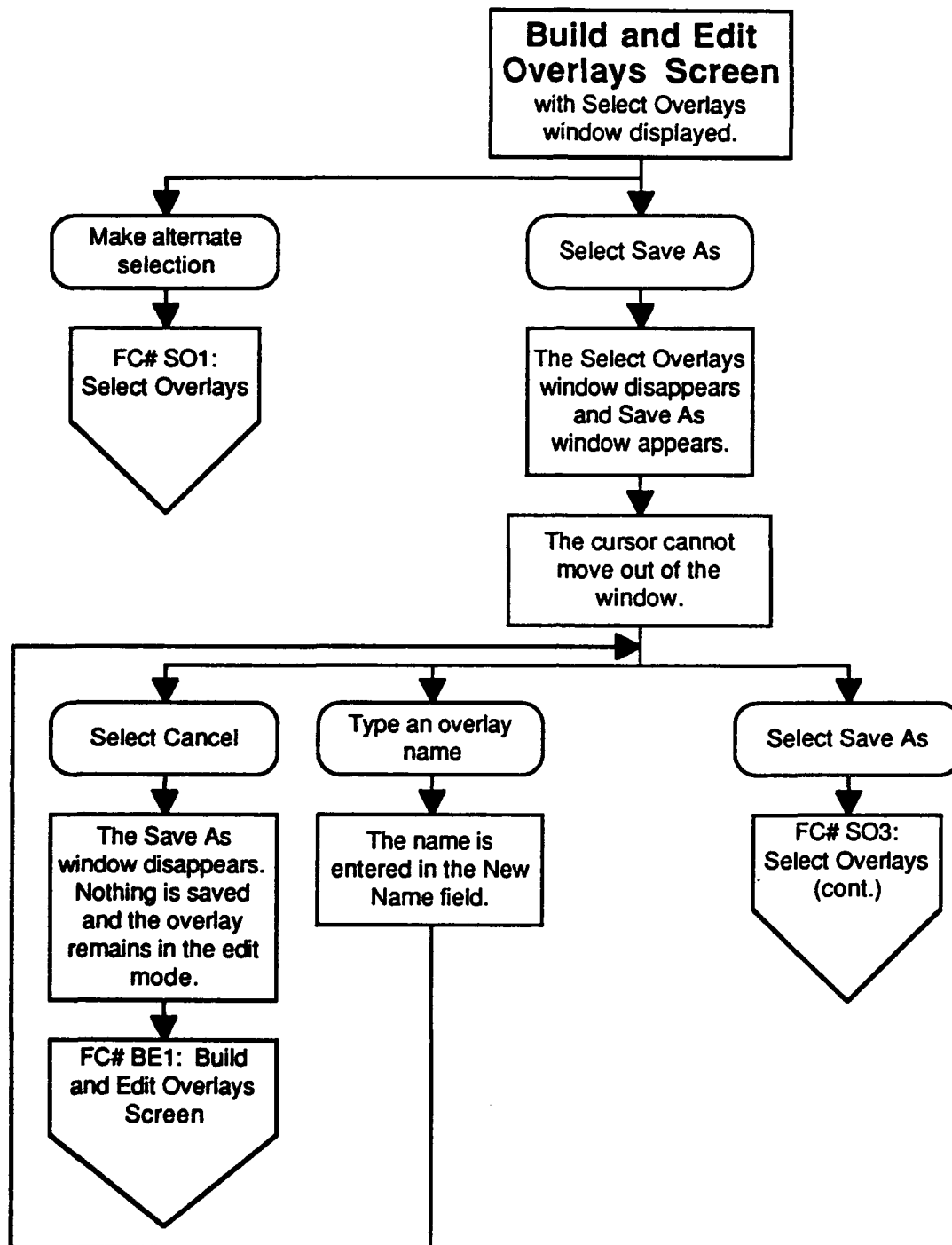


Figure A-71. Select Overlays (cont.) (FC# SO2)

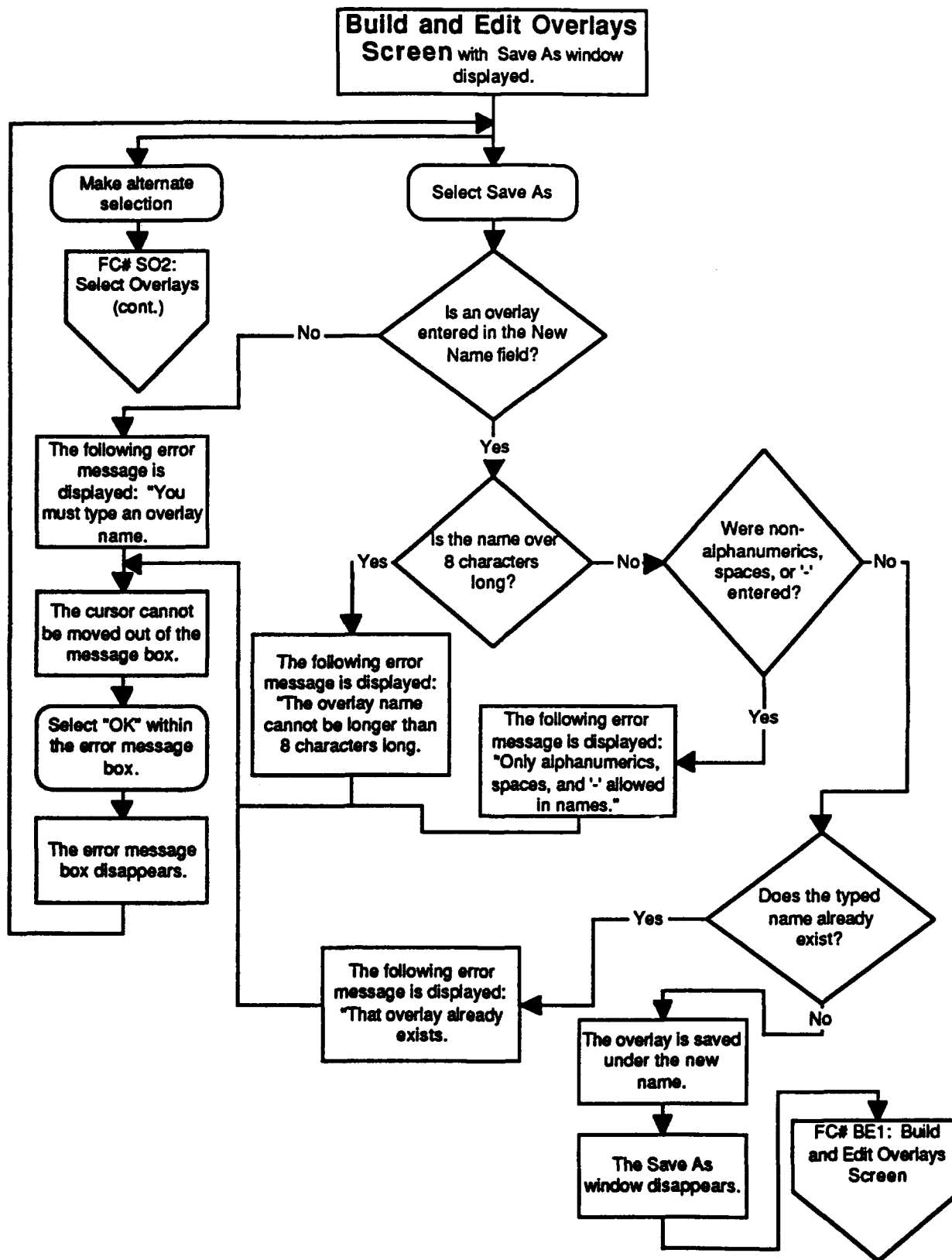


Figure A-72. Select Overlays (cont.) (FC# S03)

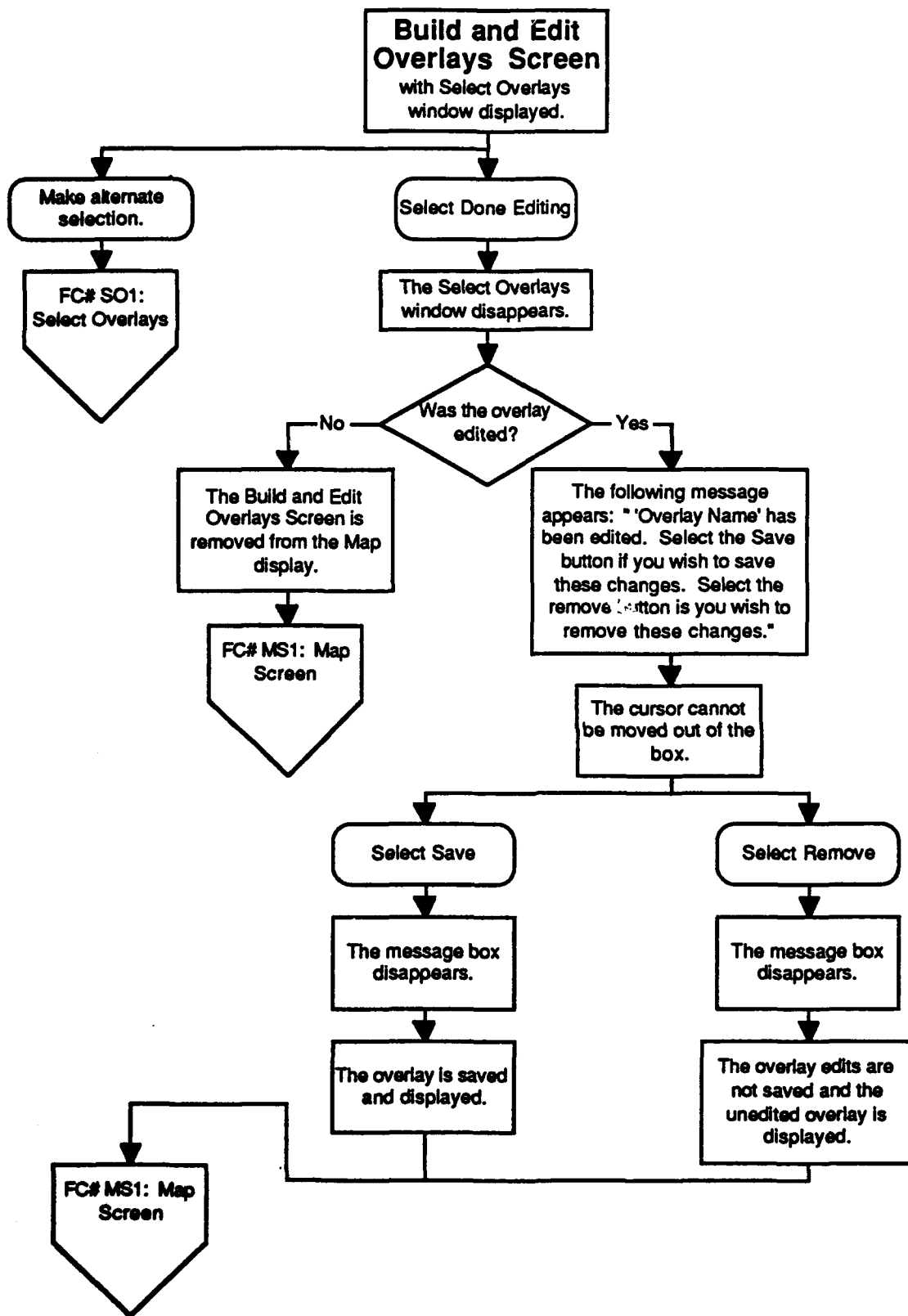


Figure A-73. Select Overlays (cont.) (FC# S04)

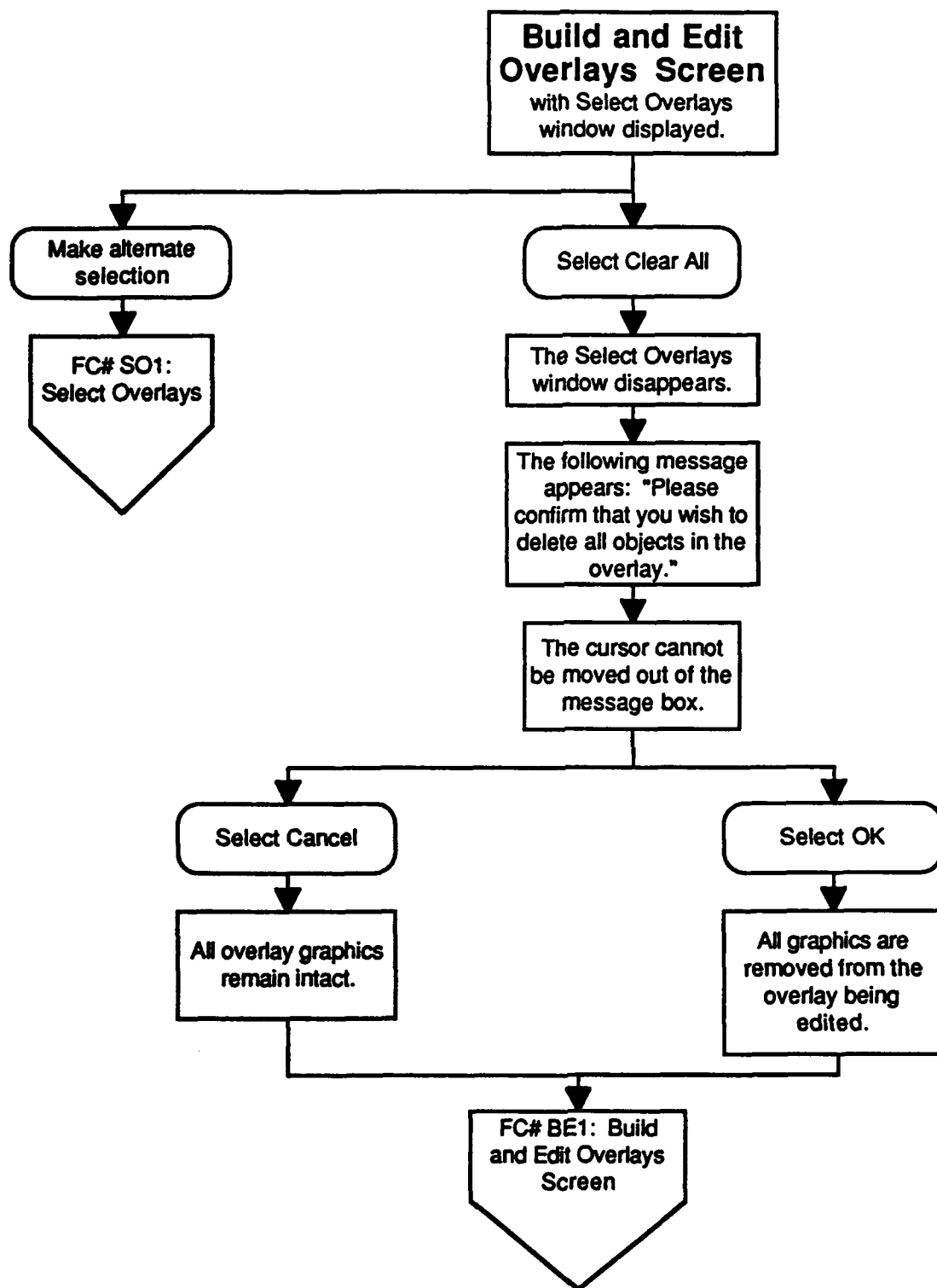


Figure A-74. Select Overlays (cont.) (FC# S05)

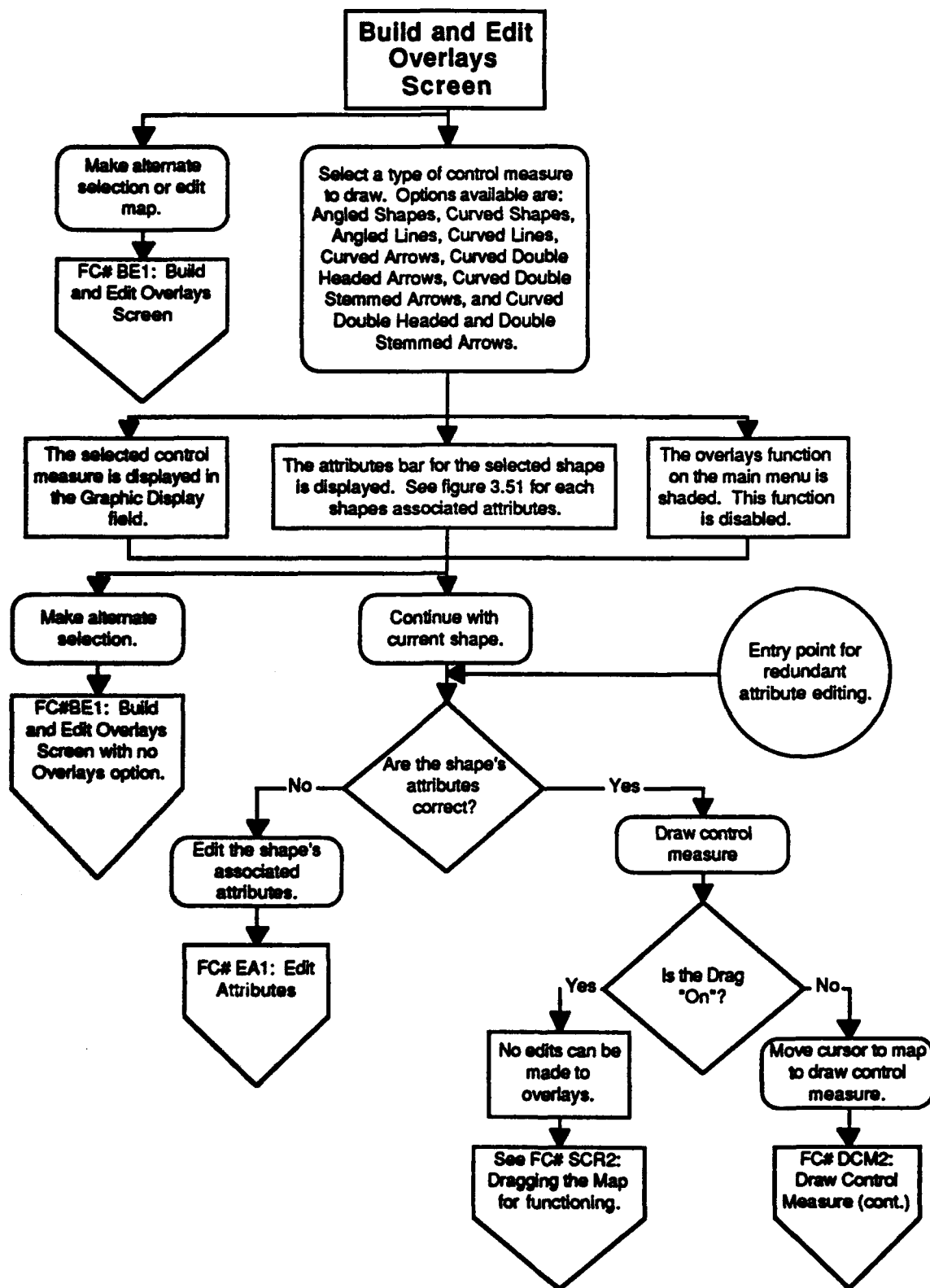


Figure A-75. Draw Control Measure (FC# DCM1)

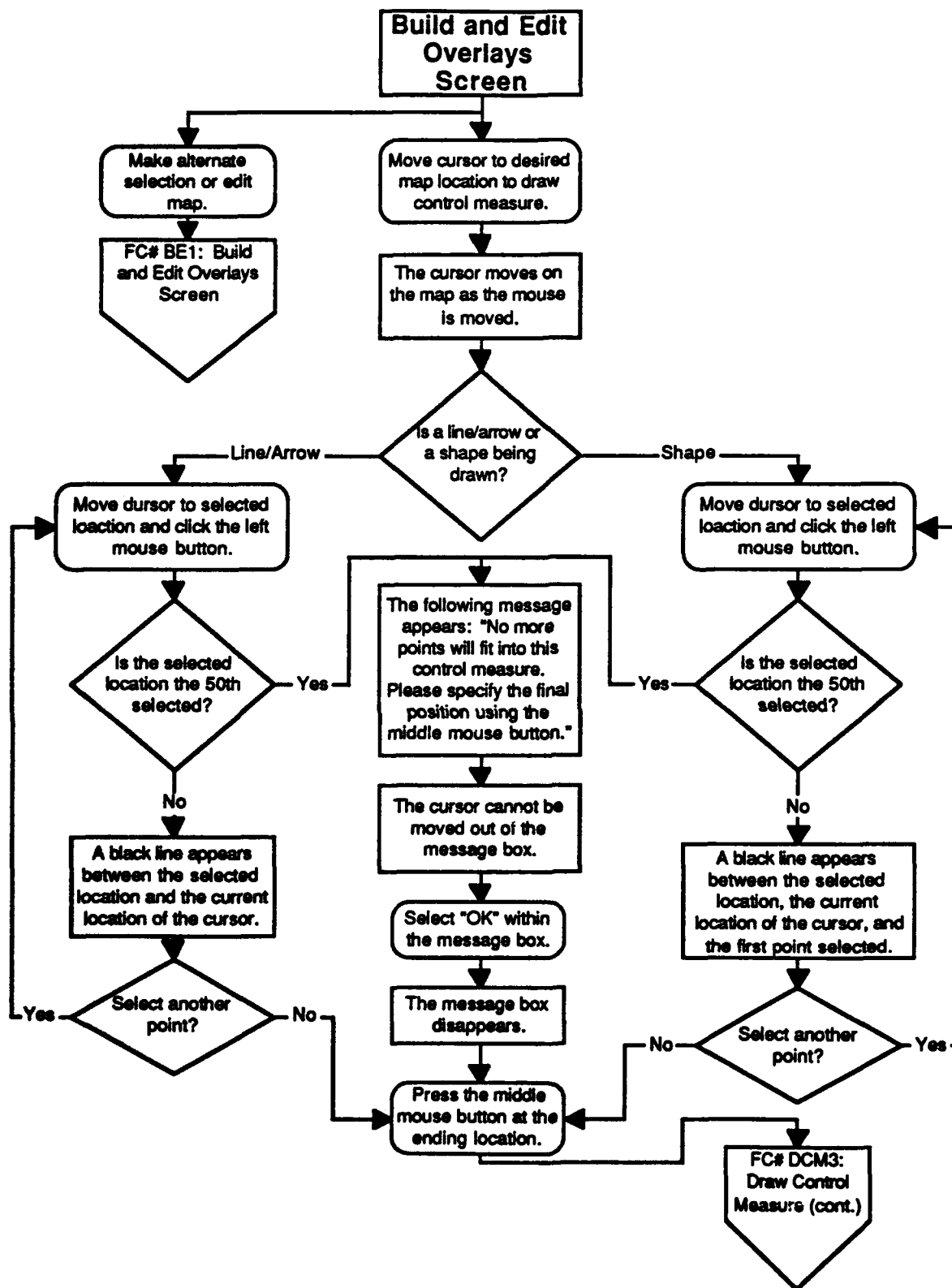


Figure A-76. Draw Control Measure (cont.) (FC# DCM2)

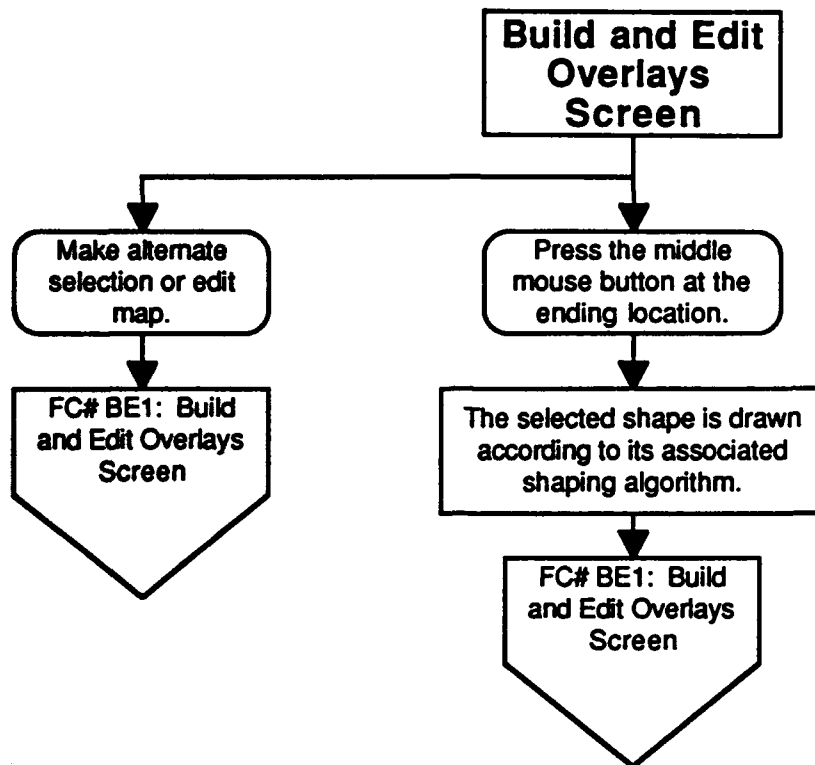


Figure A-77. Draw Control Measure (cont.) (FC# DCM3)

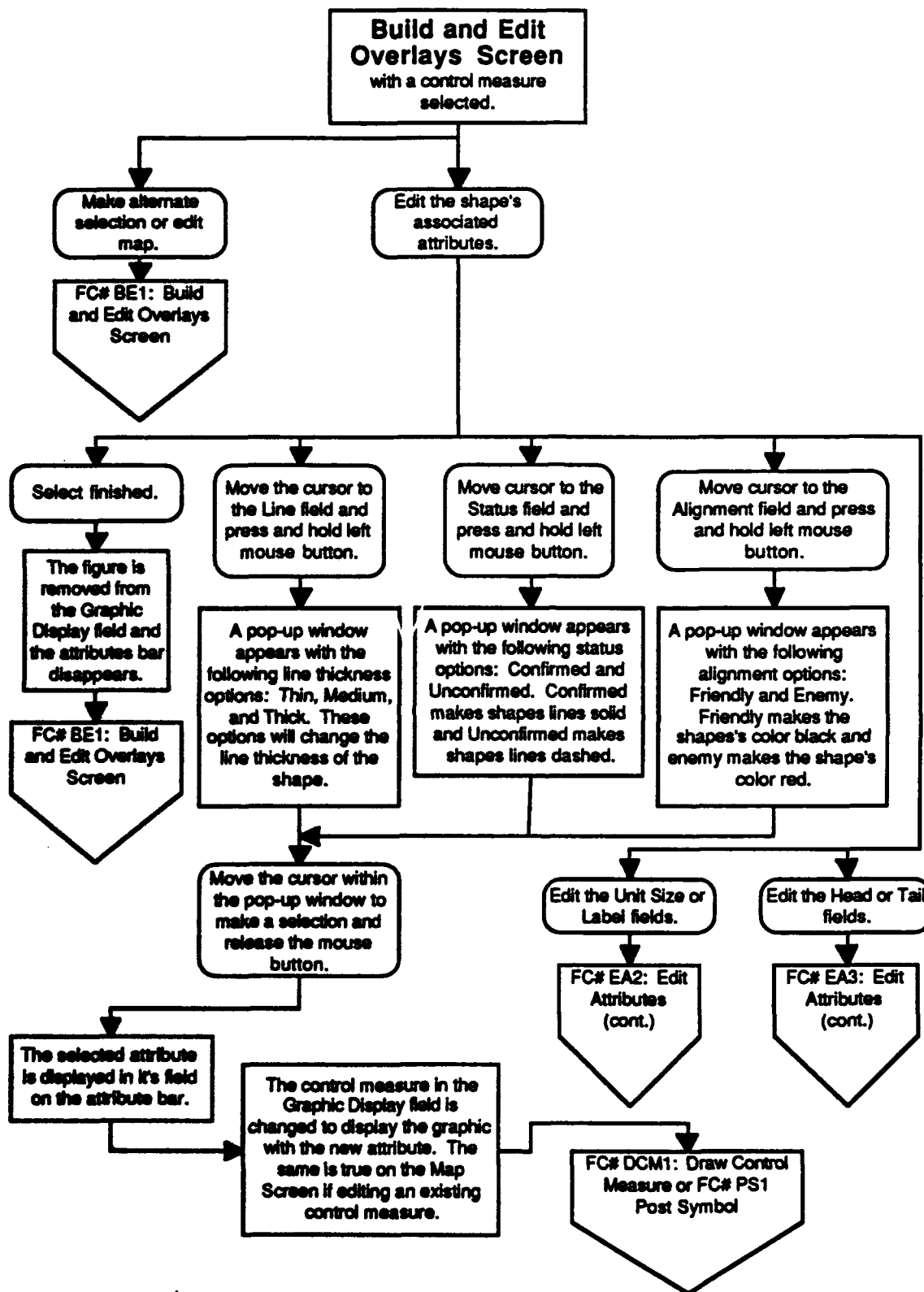


Figure A-78 Edit Attributes (FC# EA1)

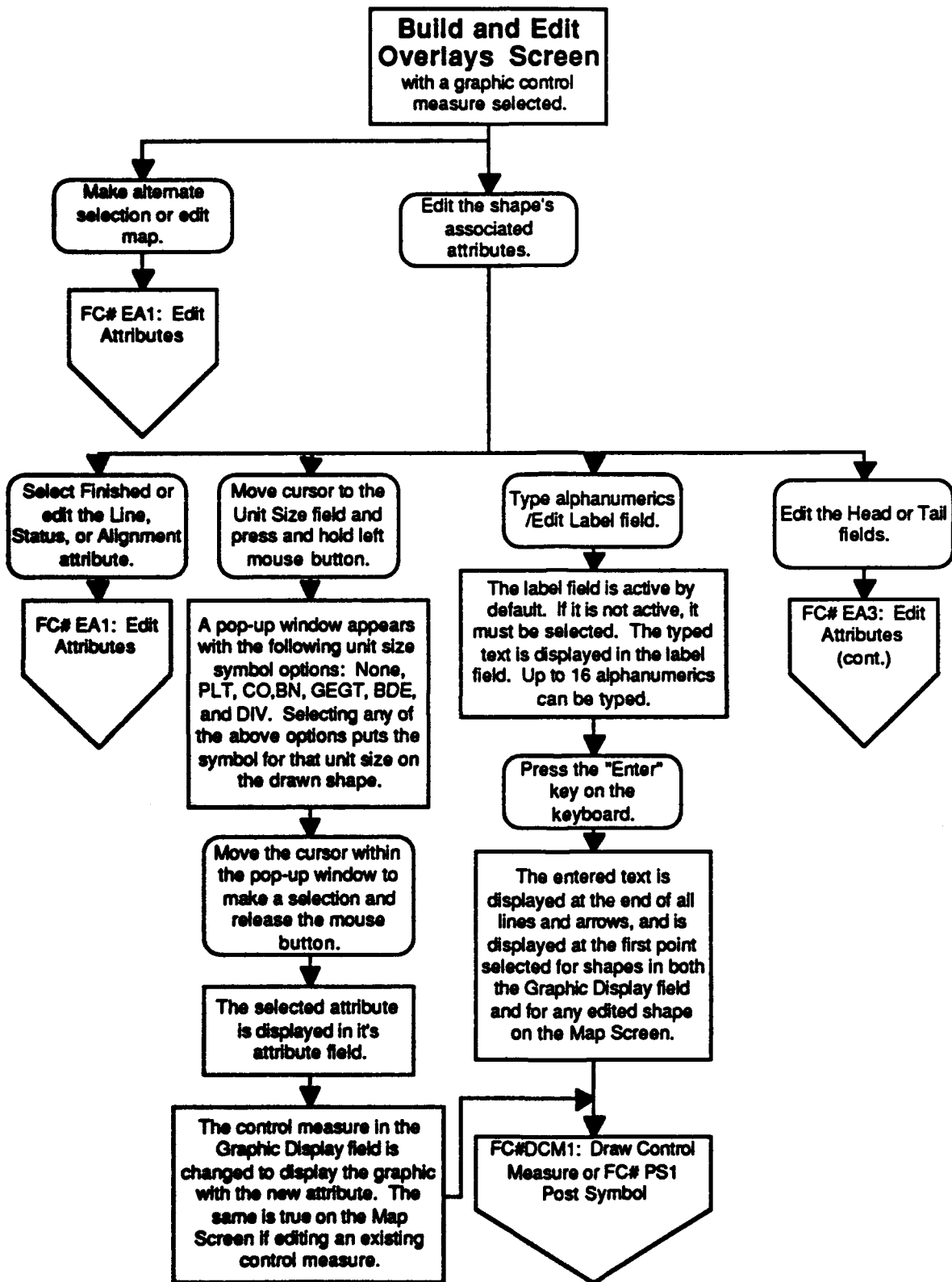
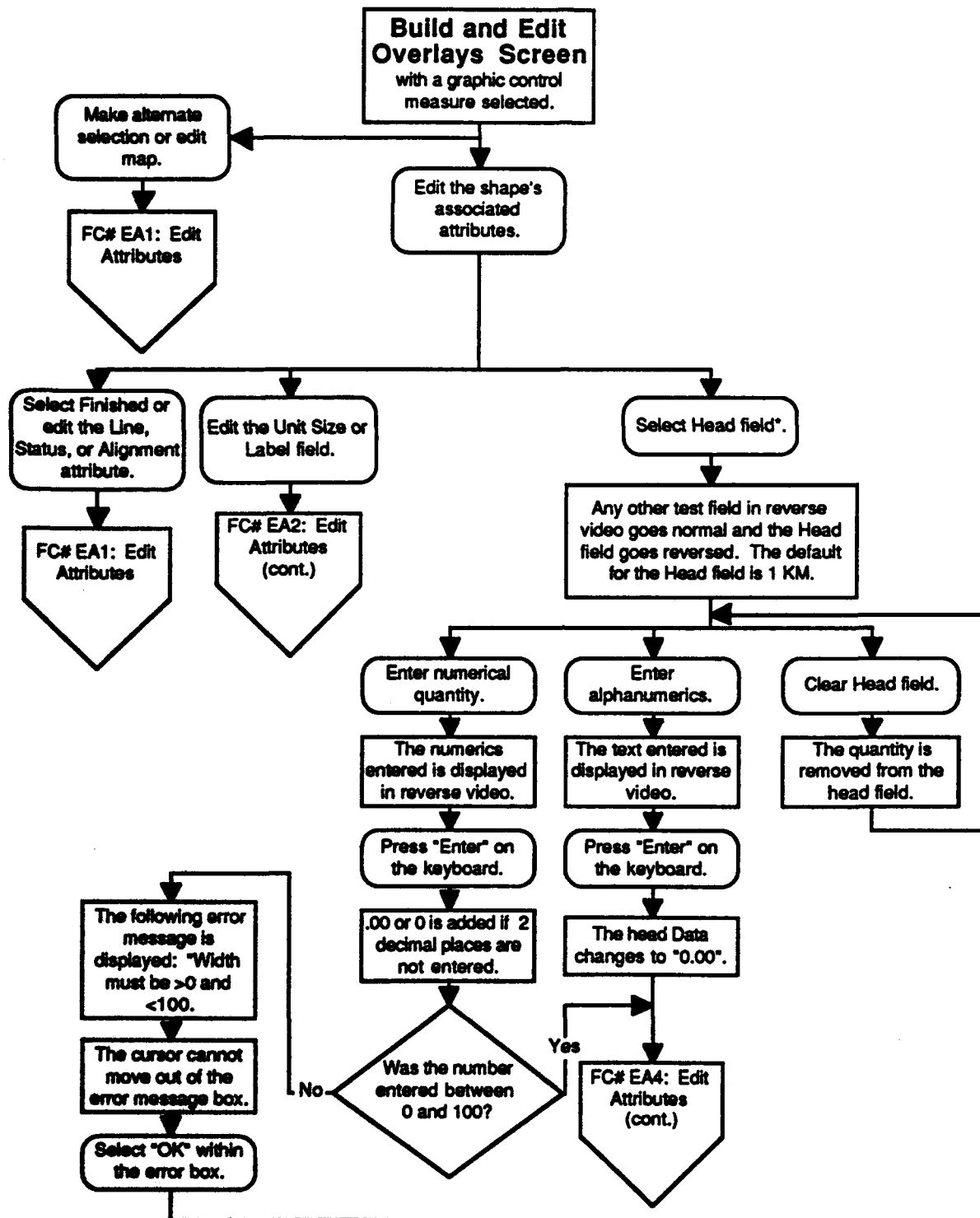


Figure A-79. Edit Attributes (cont.) (FC# EA2)



*Editing the tail field is the same as the Head field, except any changes occur at the shape's tail as opposed to the head.

Figure A-80. Edit Attributes (cont.) (FC# EA3)

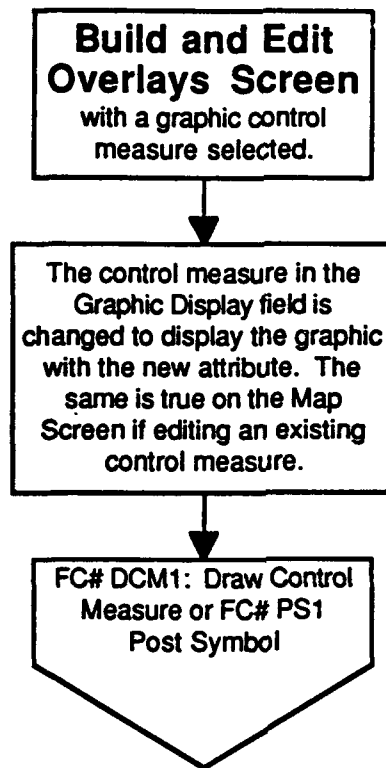


Figure A-81. Edit Attributes (cont.) (FC# EA4)

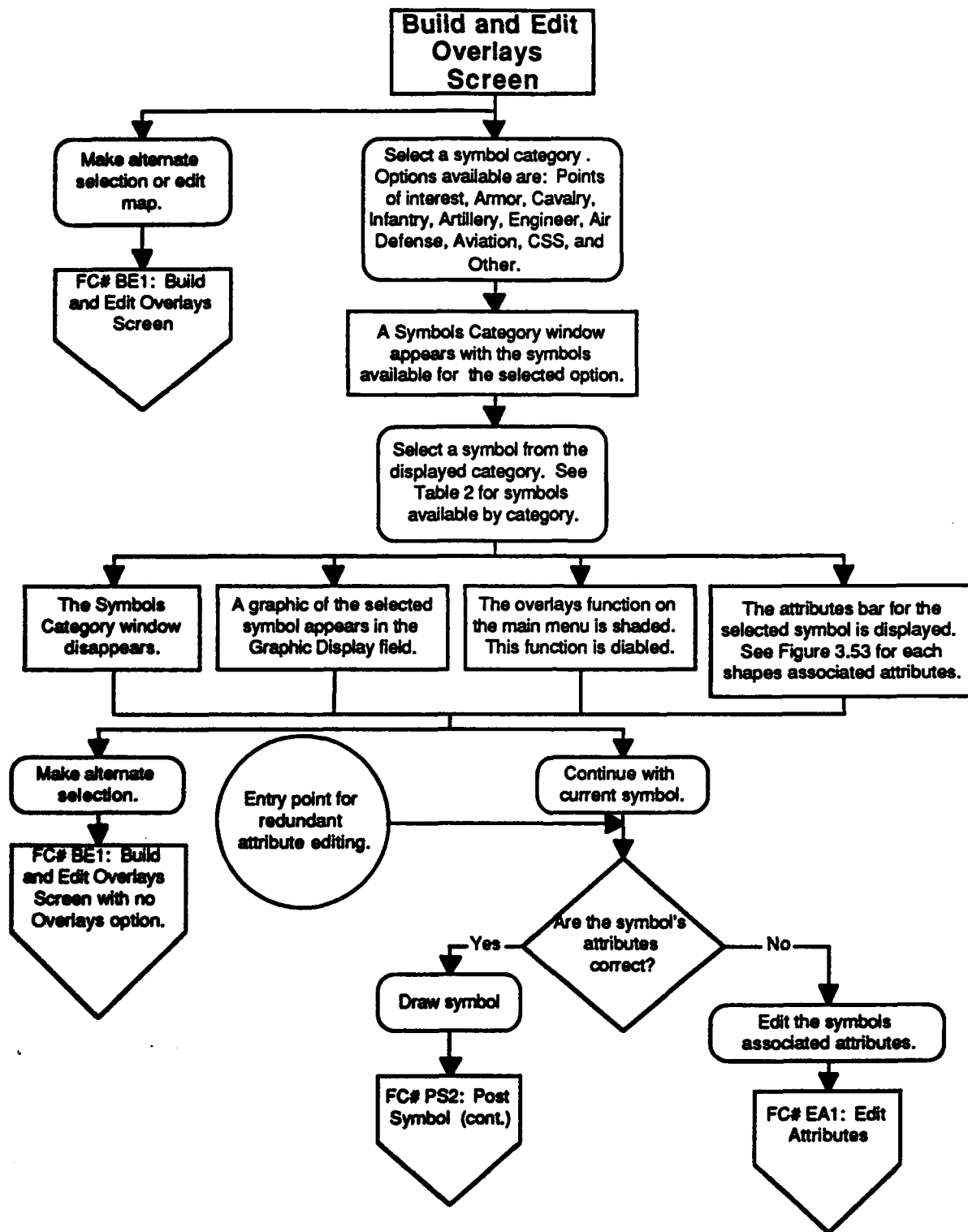


Figure A-82. Post Symbol (FC# PS1)

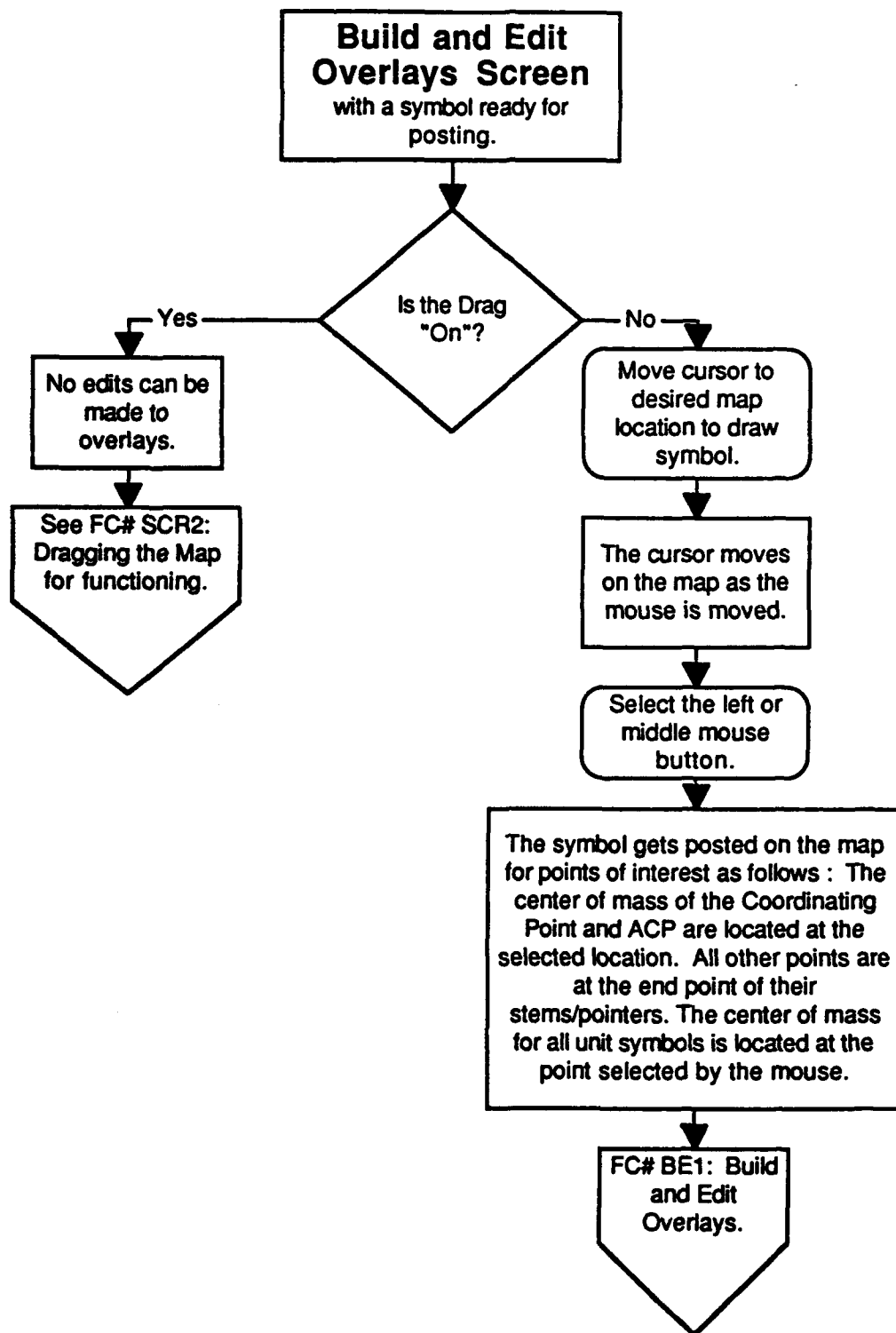


Figure A-83. Post Symbol (FC# PS2)

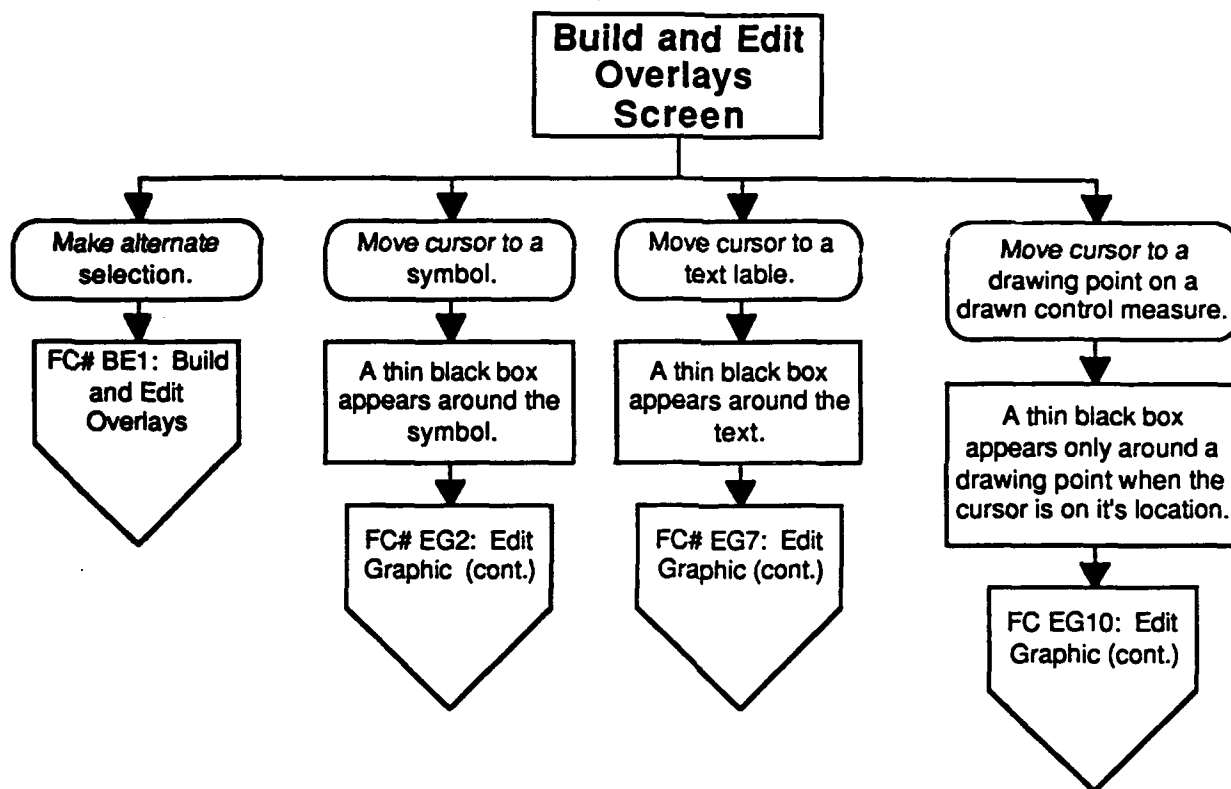


Figure A-84. Edit Graphic (FC# EG1)

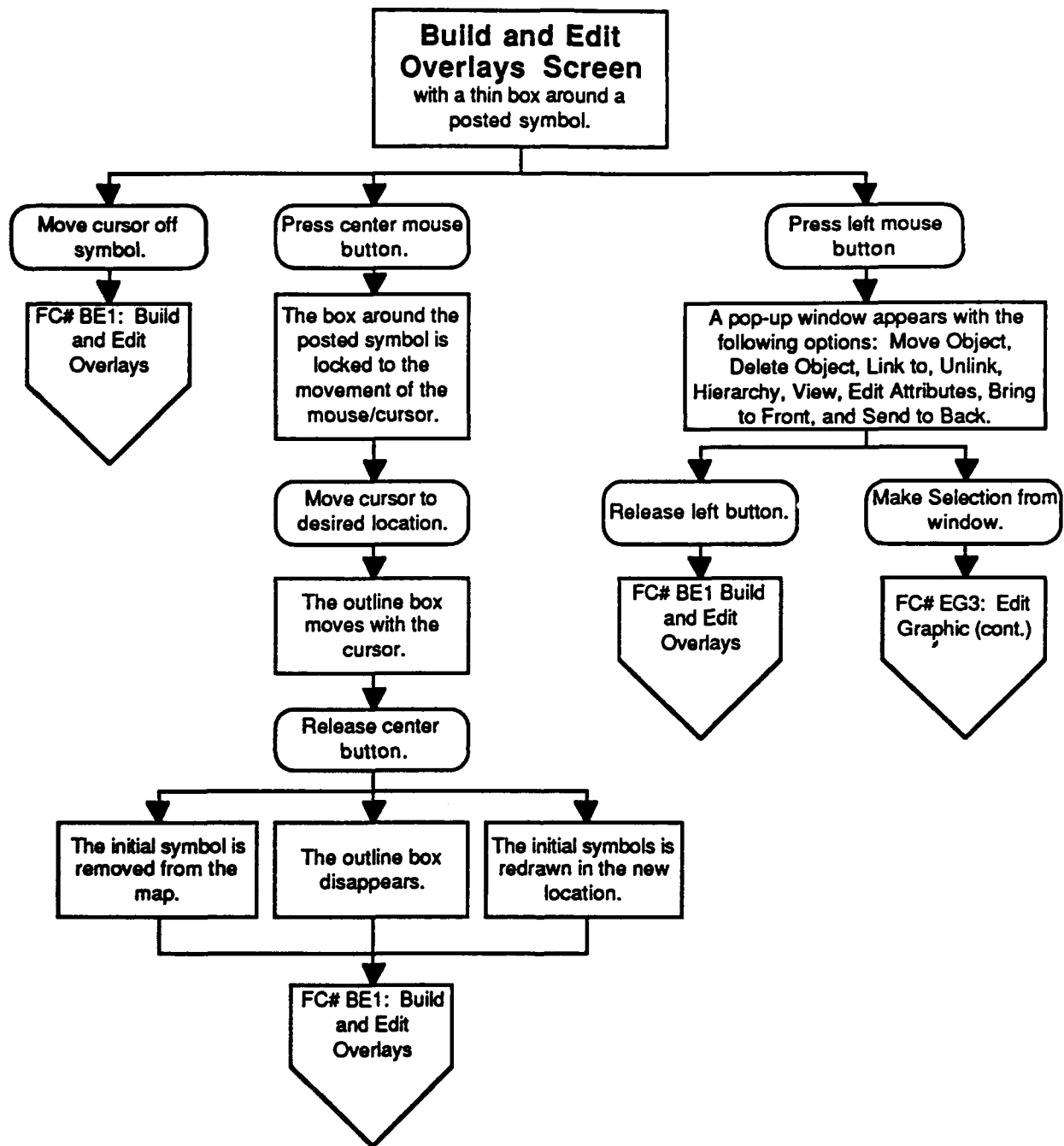


Figure A-85. Edit Graphic (cont.) (FC# EG2)

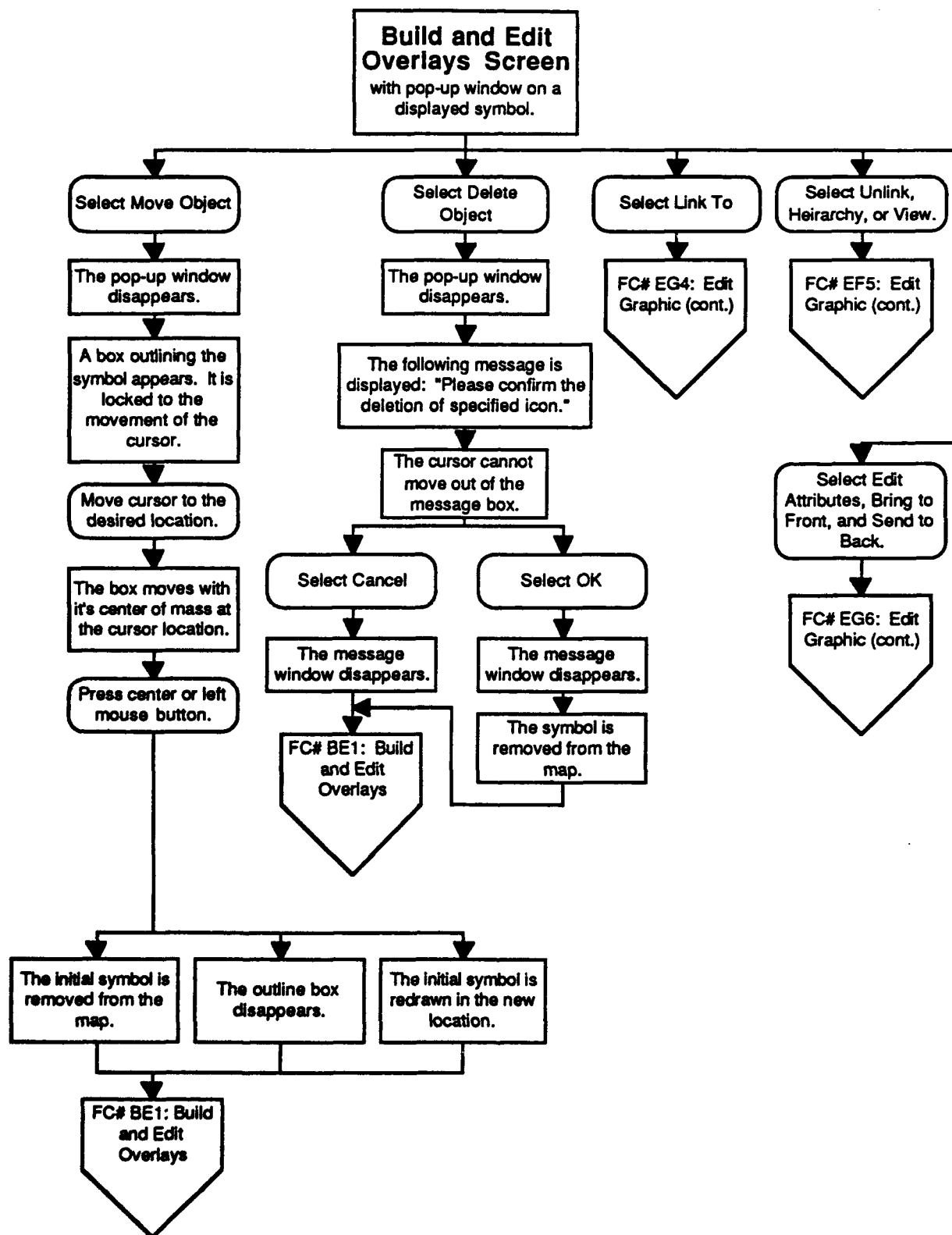


Figure A-86. Edit Graphic (cont.) (FC# EG3)

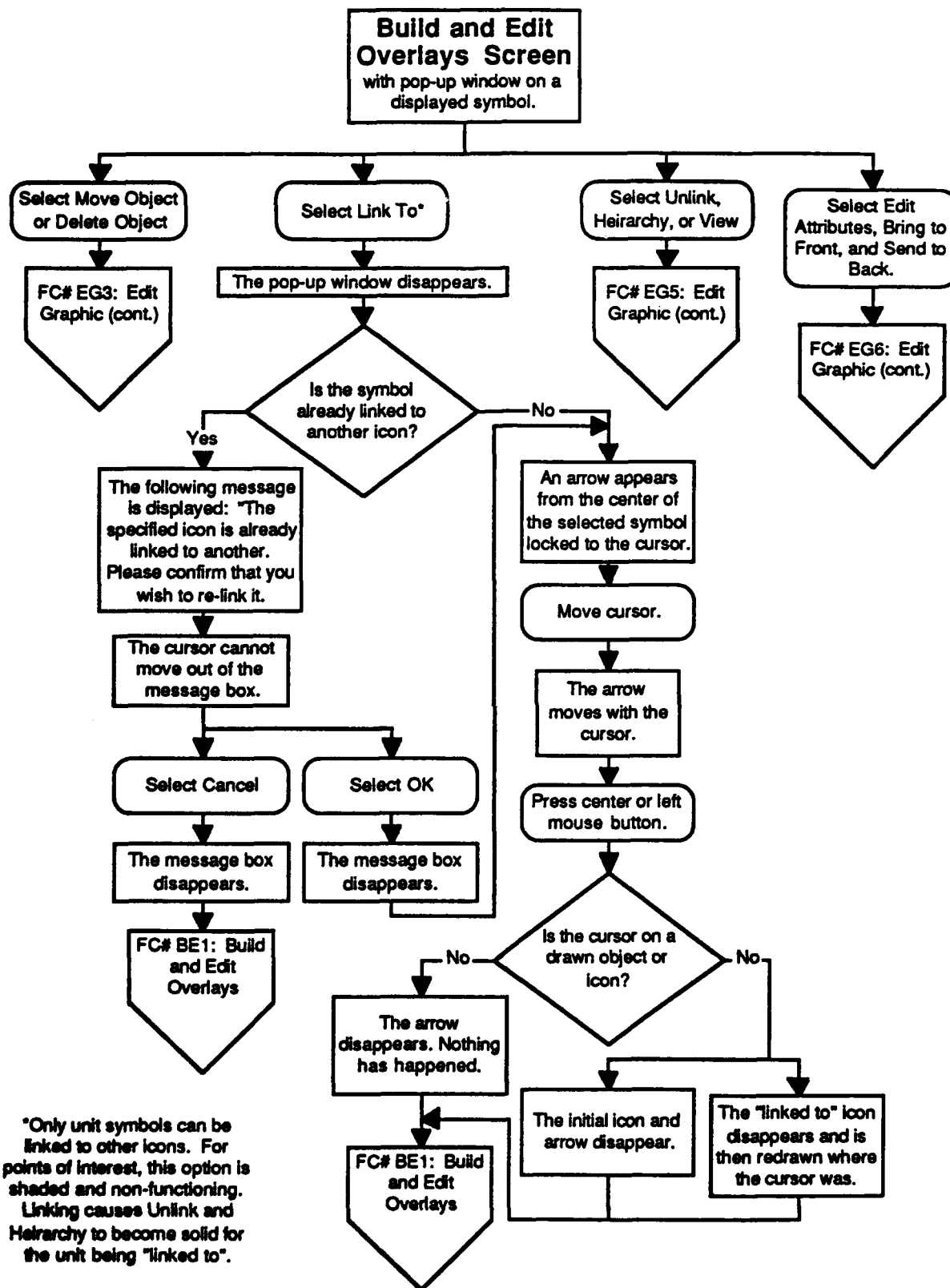


Figure A-87. Edit Graphic (cont.) (FC# EG4)

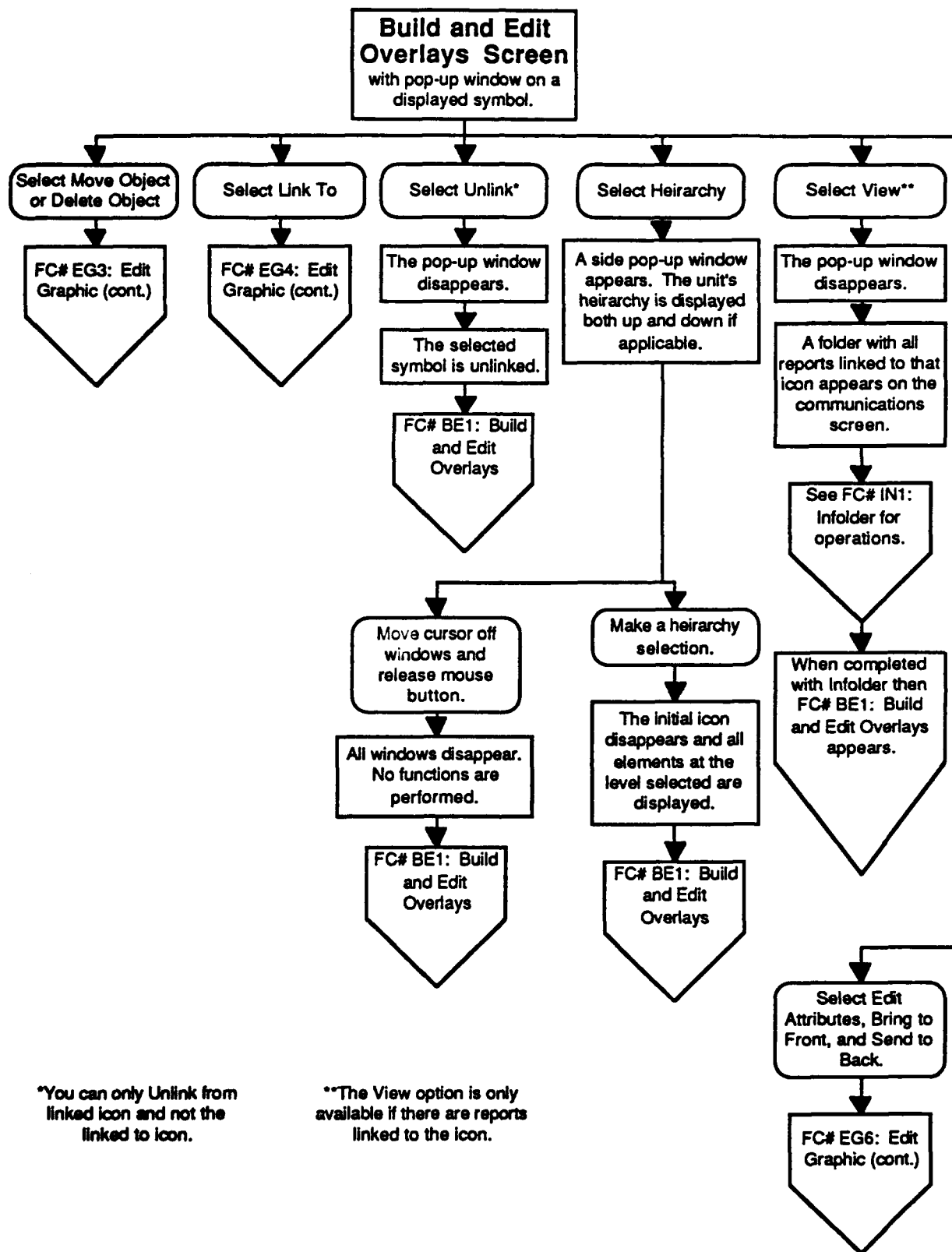


Figure A-88. Edit Graphic (cont.) (FC# EG5)

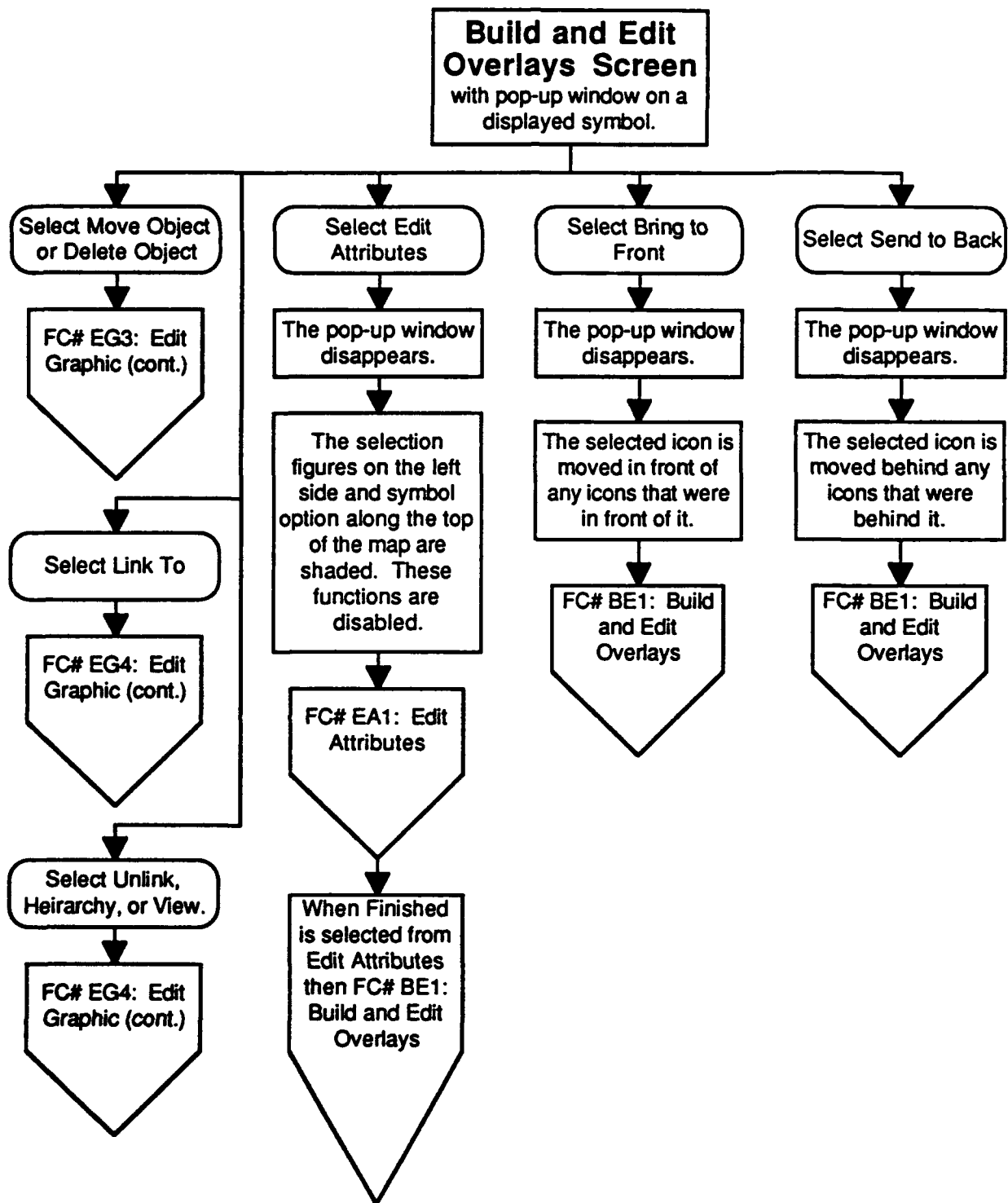


Figure A-89. Edit Graphic (cont.) (FC# EG6)

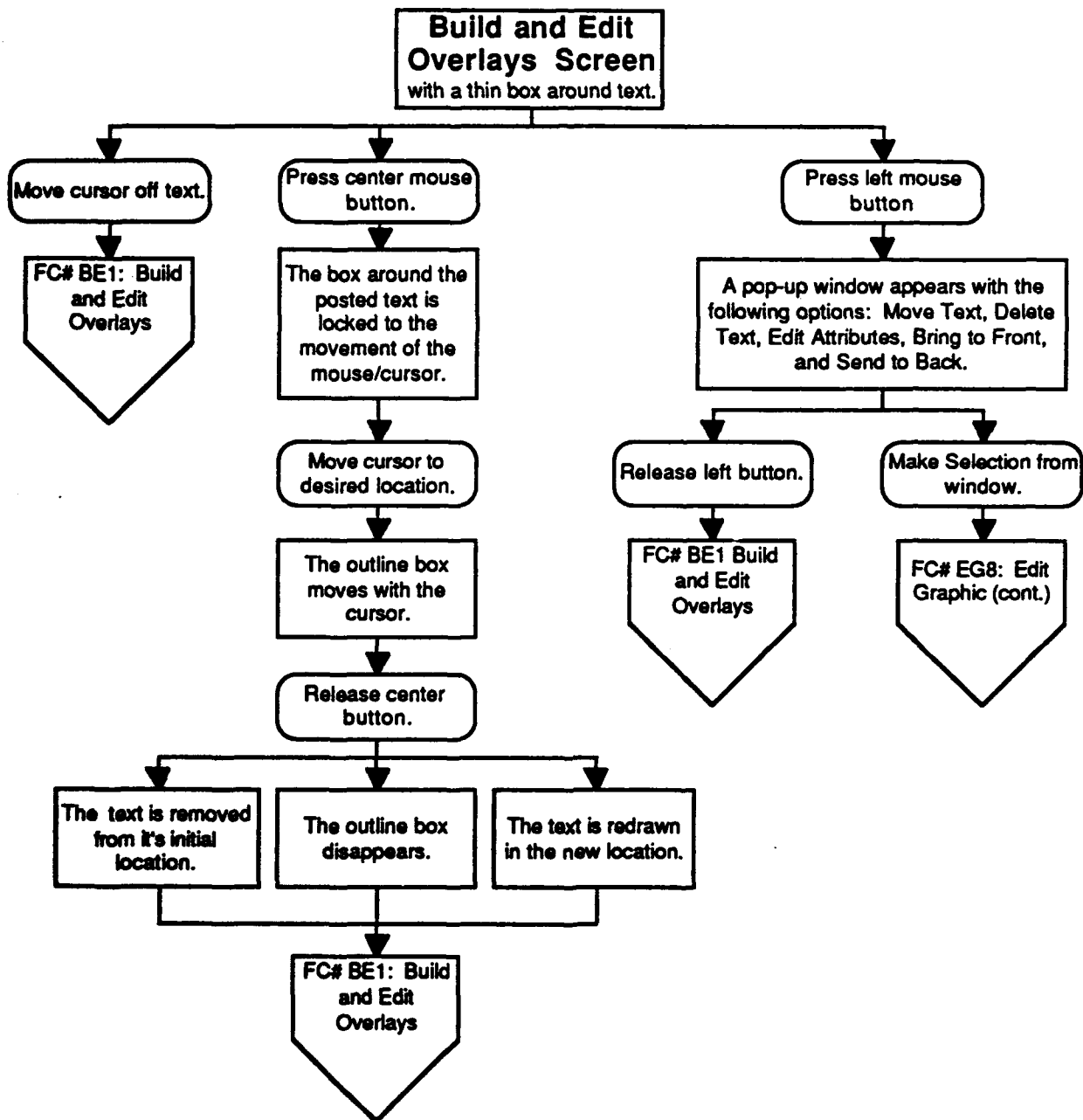


Figure A-90. Edit Graphic (cont.) (FC# EG7)

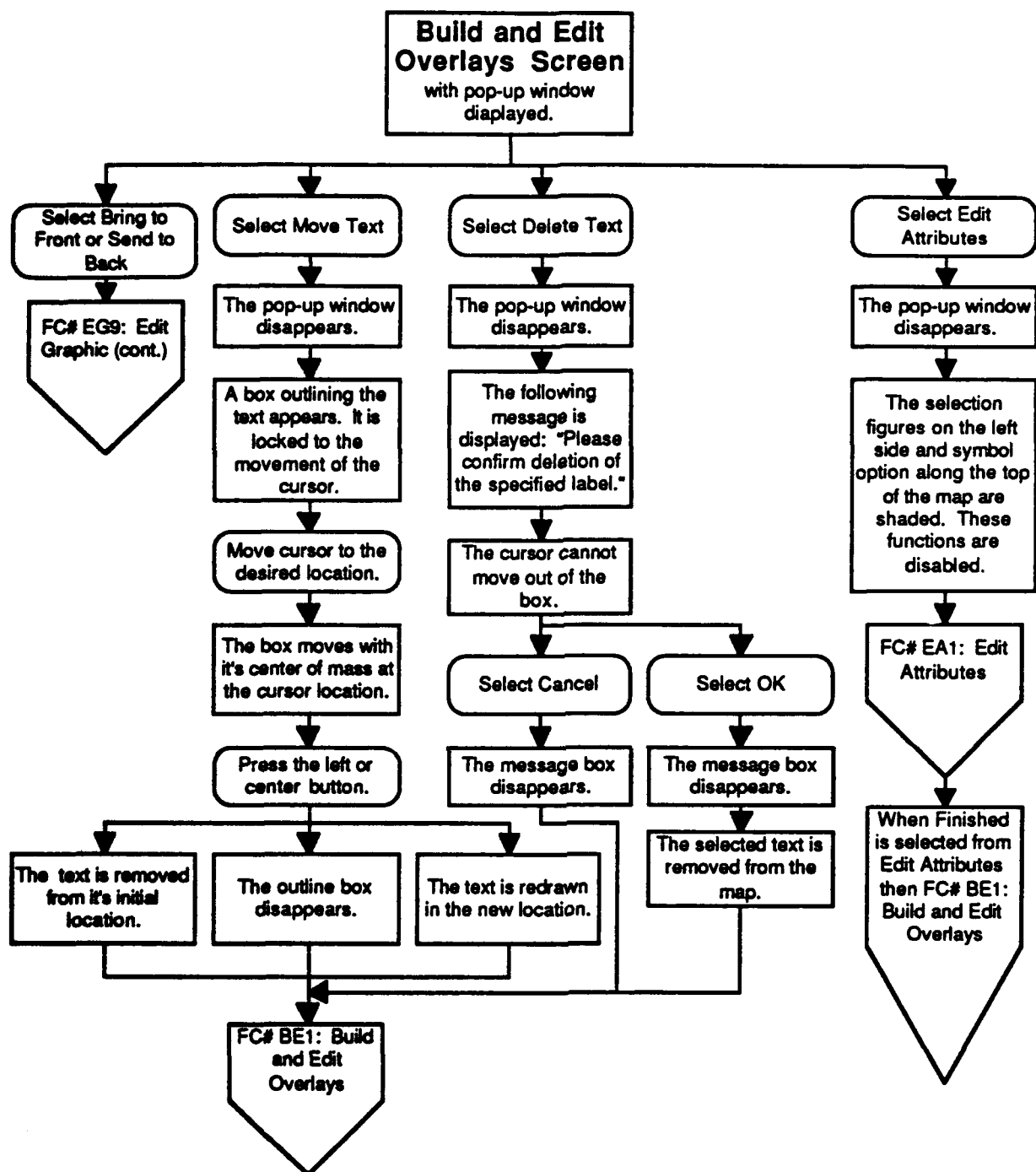


Figure A-91. Edit Graphic (cont.) (FC# EG8)

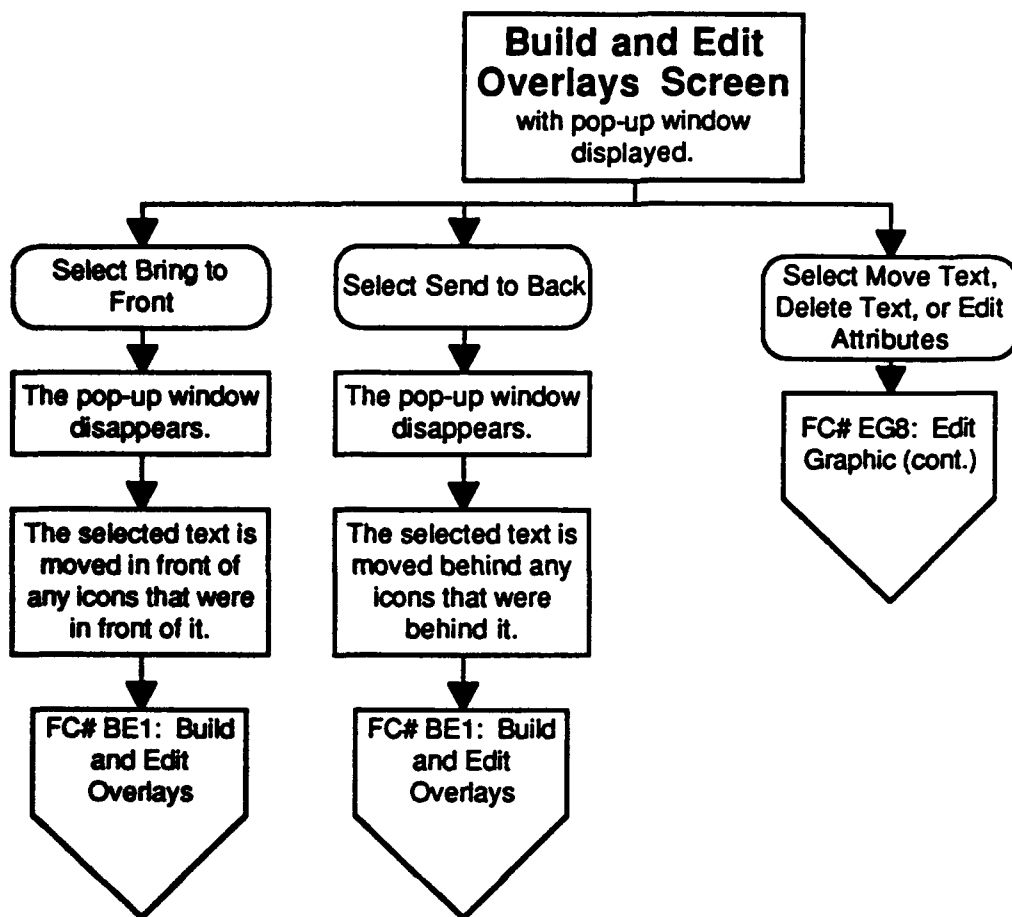


Figure A-92. Edit Graphic (cont.) (FC# EG9)

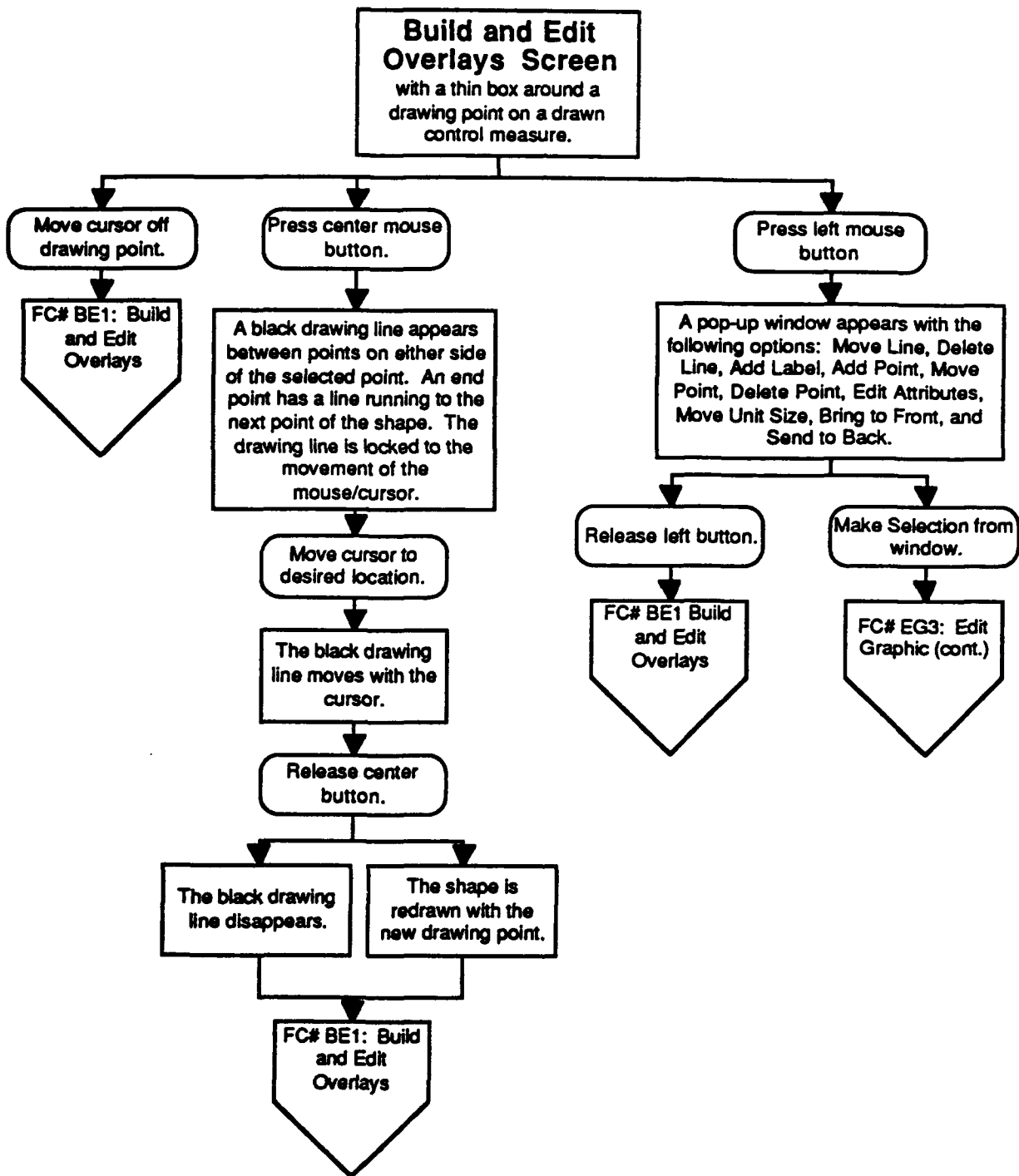


Figure A-93. Edit Graphic (cont.) (FC# EG10)

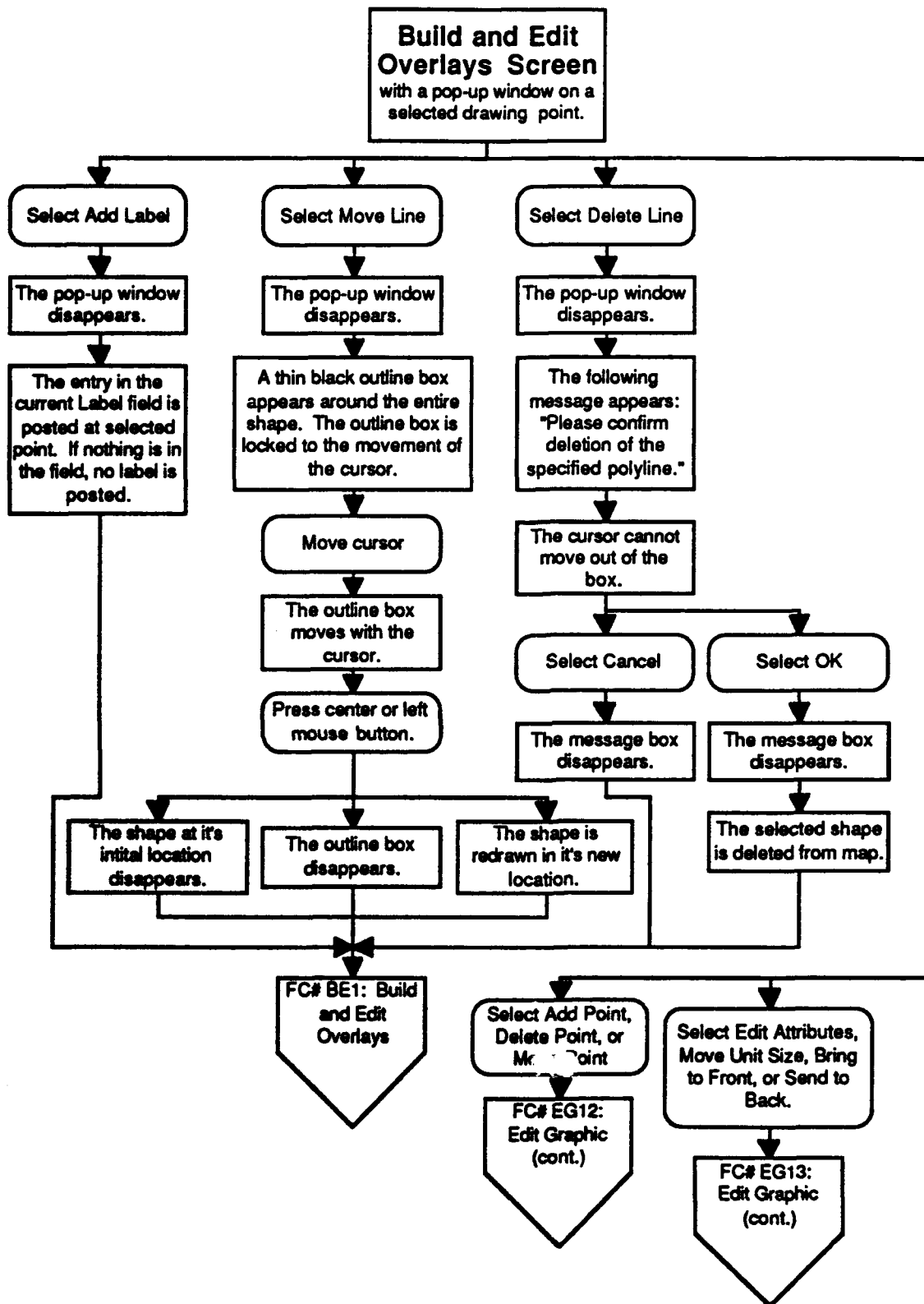


Figure A-94. Edit Graphic (cont.) (FC# EG11)

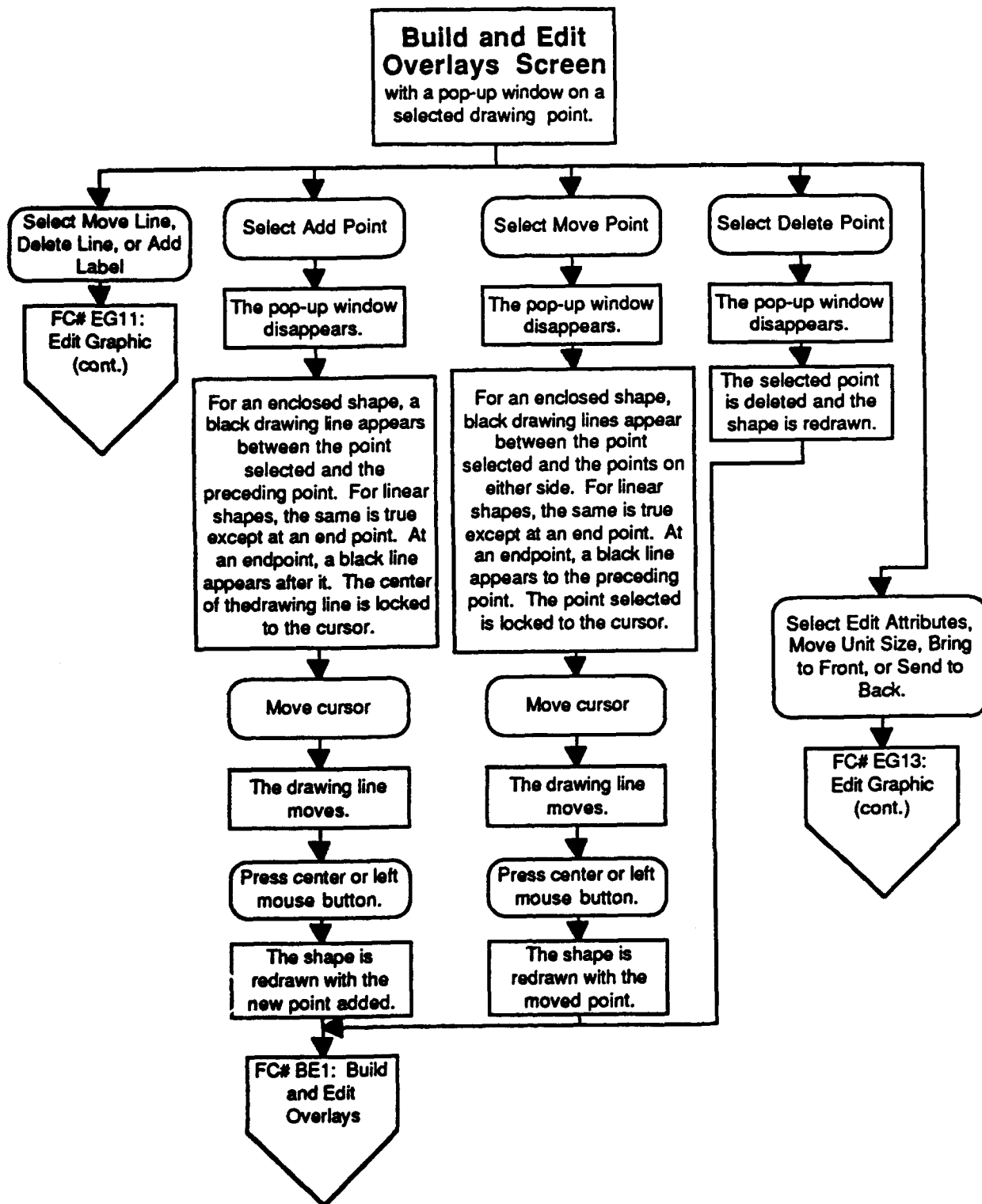
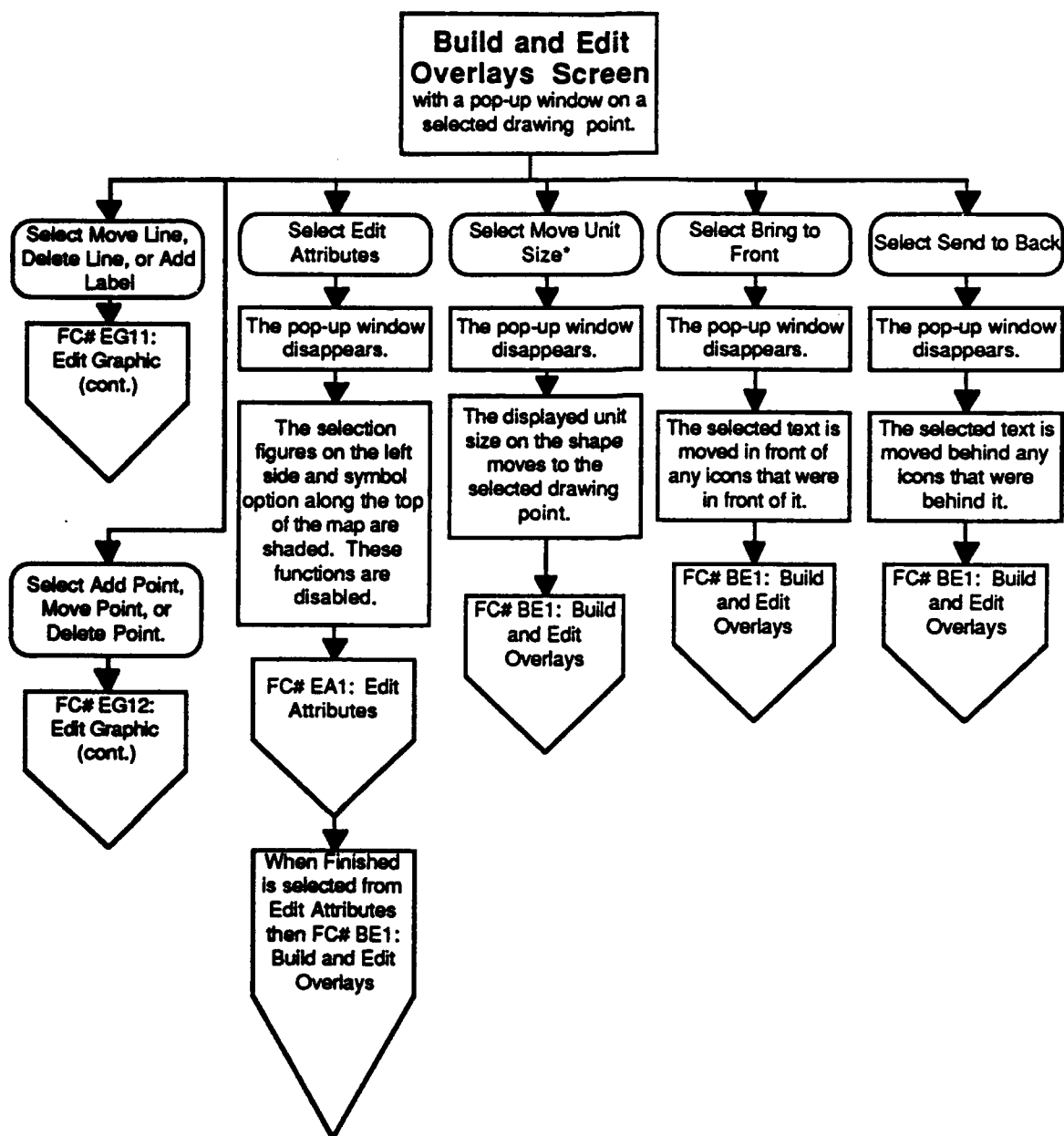
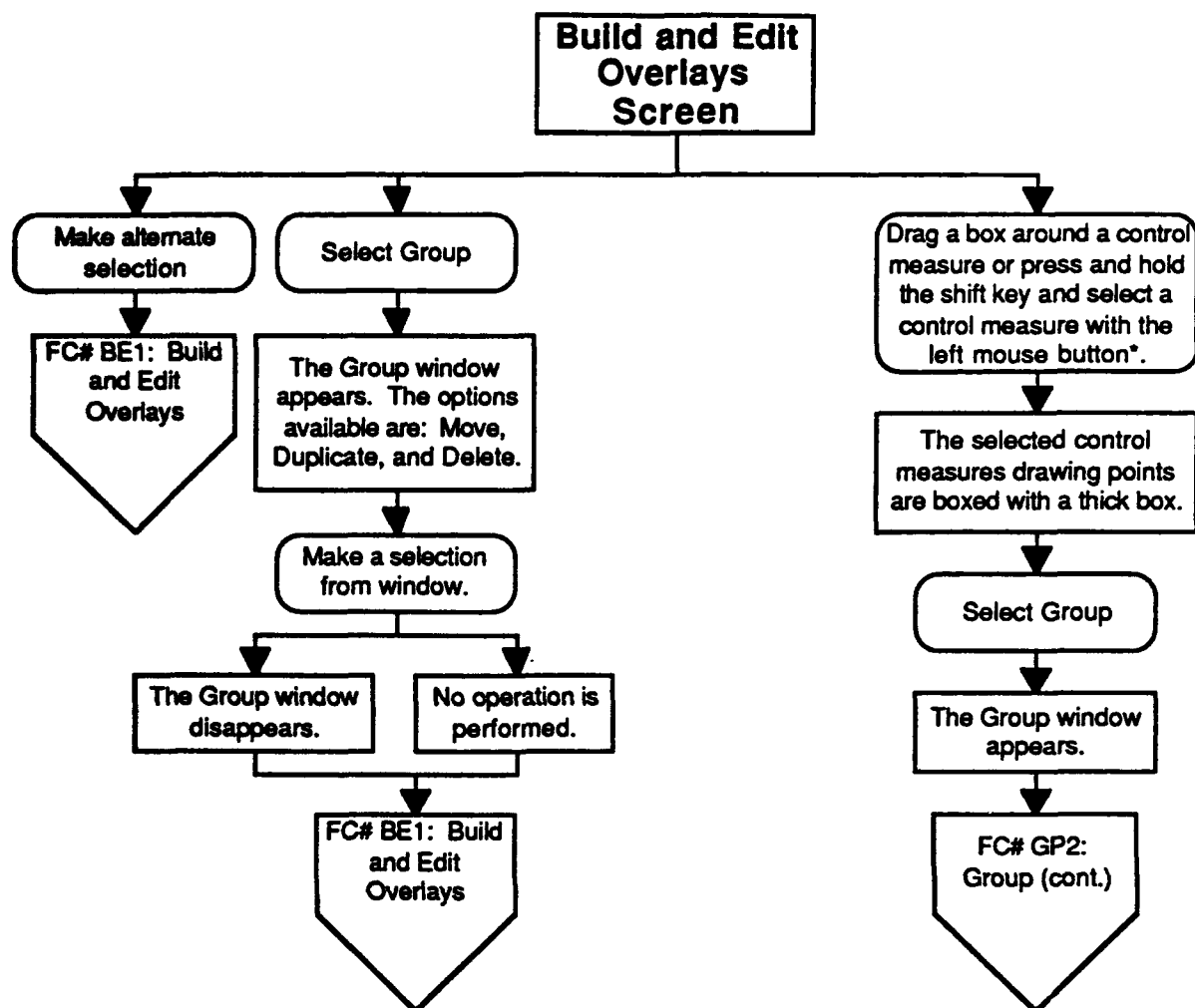


Figure A-95. Edit Graphic (cont.) (FC# EG12)



*The Move Unit Size option is not available unless a unit size is currently displayed on the control measure.

Figure A-96. Edit Graphic (cont.) (FC# ED13)



- *-For a symbol, if the area outlined by its drawing points is not in the box drawn by the cursor, then the symbol is not selected.
- If the start point of a shape is not included in the box drawn by the cursor, then the symbol is not selected.
- If an end point of a linear control measure is not included in the box drawn by the cursor, then the symbol is not selected.

Figure A-97. Group (FC# GP1)

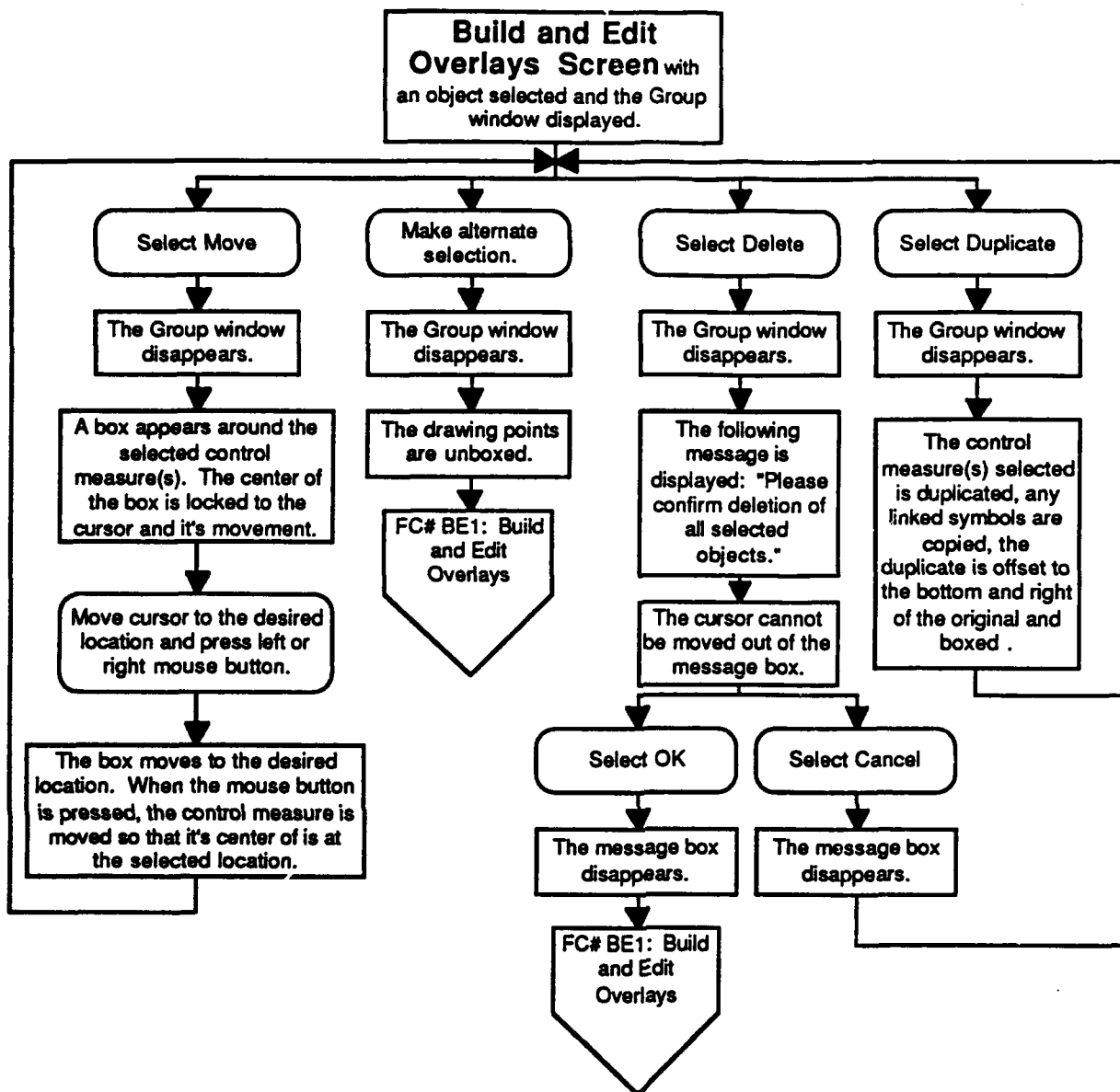


Figure A-98. Group (cont.) (FC# GP2)